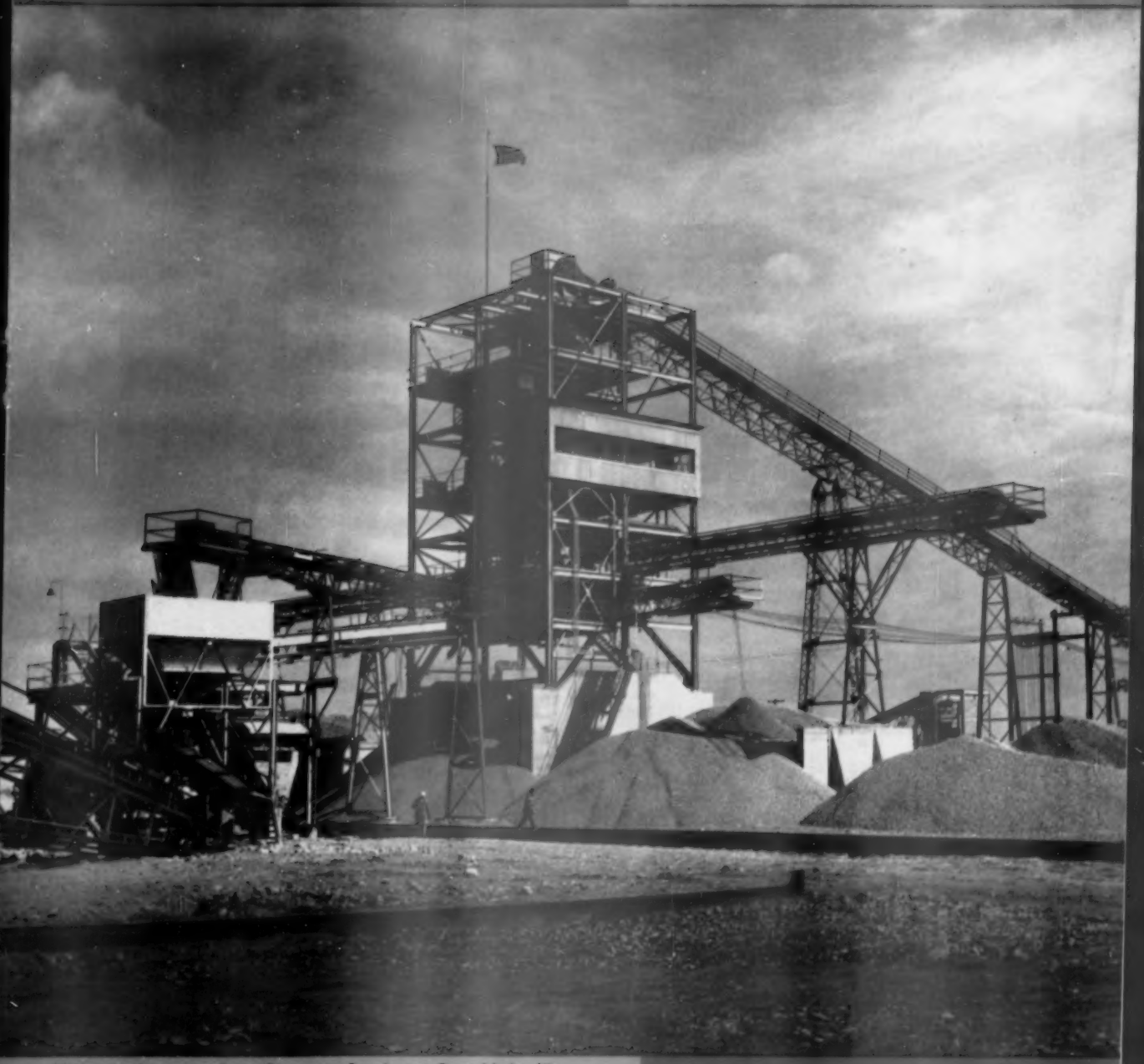
THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

Design Gravel Plant to Suit Customer Needs page 60
Kansas Turnpike Stone Plant Produces 1000 t.p.h. page 72
First to Use Pelletizer-Traveling Grate Kiln Feed page 82
Expand Industrial Sand Plant for Changing Market page 84



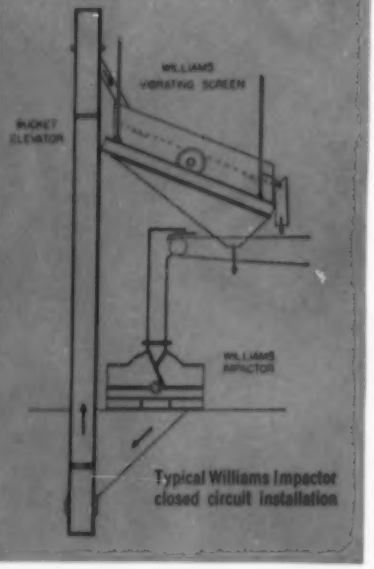
Main screening tower of new Consumers Co. plant at Crystal Lake, Ill.

JULY 1956

Lowest-Cost Crushing

with better product control

Open view showing hammers and impact blocks. Extremely rugged, heavy construction of steel plate with manganese steel liners, hammers and impact blocks. Extra large shafts are mounted in oversize bearings sealed in self-aligning housings.



Typical Williams Impactor closed circuit installation

WILLIAMS *Reversible* IMPACTOR

By properly controlling the forces of speed and mass in size reduction operations, Williams Impactors offer the lowest possible cost-per-ton in producing top quality materials from 2" down to 35 mesh with a minimum of fines . . . or much smaller where more friable products are handled. In closed circuit systems with external vibrating screens, a single Impactor promises 100% product sizing with surprising economy, even with the most difficult specifications.

No grates are required, hence no replacement expense of these parts is necessary. Quick, uniform reduction, sizing and discharge from the mill eliminates any grinding attrition action that causes excessive wear, especially if raw materials are highly abrasive. Reversible rotation eliminates manual turning of hammers and minimizes down time. Impact blocks are also reversible which further reduces cost. Parts last up to 7 times longer than in other types of equipment. Unusually low maintenance is a feature of the Impactor.

You have much to gain in lower costs and better product quality control with an Impactor. *Write for literature.*

WILLIAMS PATENT CRUSHER & PULVERIZER CO.

800 St. Louis Ave. **St. Louis 6, Mo.**

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Hammer Mills Helix-Seal Mills Roller Mills Air Separators Vibrating Screens Feeders

OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

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PRE-BILT PACKAGE

Standard 18, 24, 30 and 36-inch widths need no special engineering

Here's an economical, standardized belt conveyor "package" . . . ready to meet the majority of belt conveyor needs and perform dependably for years and years. It combines standard Link-Belt products with sectional truss frames and steel supporting bents.

Book 2579 has further data on Link-Belt PRE-BILT conveyors . . . with drives up to 40 hp and 24 and 42-inch truss depths. Write today, or ask for a copy at your nearest Link-Belt office.

easy selection

Your Link-Belt representative will help you select the best combination of PRE-BILT sectional belt conveyor components.

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BELT CONVEYOR EQUIPMENT

prompt quotations

He will prepare a comprehensive and accurate estimate of requirements for installations that permit "on-the-ground" survey.

simplified purchase

Parts are standardized, interchangeable, all available from one supplier. Link-Belt representative can furnish all data.

quick delivery

PRE-BILT conveyors are built at nine strategic locations throughout the country and are shipped from the plant nearest you.

fast installation

Can be readily handled by your own erectors in most cases. Link-Belt can also furnish complete erection service and supervision.

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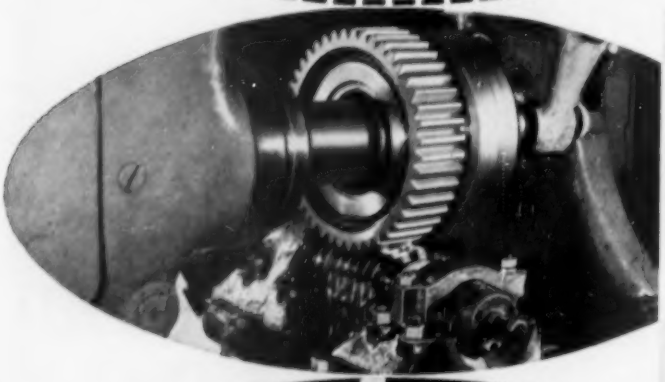
Important reasons why it pays to use True Original Parts

Allis-Chalmers True Original Parts start right. Each benefits from one of industry's most intensive metallurgical research programs. And each is designed by experienced construction machinery engineers to do a specific job . . . with ample capacity to carry a full share of the work load just as the new equipment part did.



1 PRECISION-MADE

Skilled craftsmen bring True Original Parts to life—working with the most modern manufacturing equipment and meeting the highest industrial standards. The result: precision-made parts get full work power from your Allis-Chalmers machinery.

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True Original Parts go through rigid original-equipment inspection and testing processes to assure long-life service. For example, gears are checked again and again for perfect meshing . . . for true balance . . . for full capacity.

3 PROPERLY PACKAGED

You want your parts factory-new . . . and that's how you get True Original Parts. Many are specially treated . . . then sealed and packaged against rust, dust and damage.

A country-wide network of dealers stock ample supplies of True Original Parts. Whether you're working in one area or across the country, you can depend on reliable parts service close to your job from your Allis-Chalmers Construction Machinery dealer.

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ALLIS-CHALMERS

B.F.Goodrich

It used to burn up every 6 months

A typical example of B. F. Goodrich improvement in rubber

You could smell the belt burning, see the cracks in it. Limestone sand, to be used in making window glass, is heated to 300 degrees, then dumped onto a moving belt to be carried away from the furnace. But the sizzling heat burned out belts of almost every known make—they averaged only six months.

Then an engineer suggested a new, improved B. F. Goodrich hot-material belt, called Solarflex. It's made with a special kind of rubber that stays soft and pliable even at temperatures that cause other belts to harden and crack.

They fastened a length of the new B. F. Goodrich belting to the hot material belt you see here. The heat ruined the regular belt as usual—but not the Solarflex. It has now outlasted three standard hot-material belts, is still going strong after two years.

B. F. Goodrich conveyor belts invariably save money for users because they're engineered for the special jobs to be done. Some kinds of belts stand crashing blows, lasting far longer than others ever used to last. Some are made to handle wet, sticky or freezing materials without clogging pulleys. Some are made to carry packages and other things up very steep inclines. In fact, there's a B. F. Goodrich belt for almost every problem.

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ROCK

CONTENTS JULY 1956

ROCK PRODUCTS

The Customer Writes His Own Ticket at Crystal Lake Where Sand and Gravel Gradation is Pre-engineered 60
Open new plant of Consumers Co., which has a very efficient system of stockpiling and blending *George C. Lindsay*

Perlite Comes of Age 67
Here's how perlite has been accepted in the construction industry. Atlantic Perlite Company's plant in Washington, D.C. is typical operation

Producing 1½ Million Tons for Kansas Turnpike 72
Around-the-clock operation of the Concrete Materials and Construction Co., Eskridge, Kans., plant to meet September dead-line *Kenneth A. Gutschick*

Marquette Plant First to Use New ACL Manufacturing Process 82
Milwaukee, Wis., plant now being built by Marquette Cement Manufacturing Co., will use pelletizer and travelling grate to feed kiln *Joseph N. Bell*

Plant Expansion Tuned to Changing Market Requirements 84
Industrial sands to meet more stringent specifications now being produced at Port Elizabeth, N.J. plant of Millville Silica Sand and Gravel Co. *George C. Lindsay*

"Black Gold" from Sand and Gravel Deposit 92
Titanium minerals recovered by Humphrey Gold Corporation in new Highland plant near Lawtey, Fla. *Walter B. Lenhart*

Research on the Hydraulic Properties of Granulated Blast Furnace Slag 106

CONCRETE PRODUCTS

Proportioning System Measures, Records and Delivers Materials to Mixer 143
Prescription concrete made possible at the J. P. Loomis Concrete & Supply Co., Akron, Ohio by special weighing apparatus

Autoclaves Boost Texcrete Production 146
Expand capacity of Texas Industries block plant at Dallas with four new autoclaves, a third block machine and more bin capacity

Electronic Proportioning for Dry Mix Concrete Products—*Walter B. Lenhart* 148

Prestressed Concrete Producers Plan for Big Expansion Program 150

Mixer-Maintenance—Jas. A. Nicholson 154

DEPARTMENTS

What's Happening	13	Industry News	37
Editor's Page—Ready for Expansion	19	Hints and Helps	49
Labor Relations	23	New Machinery	52
People in the News	27		

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THE INDUSTRY'S RECOGNIZED AUTHORITY

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DON'T MISS IN THIS ISSUE

New Illinois Gravel Plant

Completely pre-engineered design is a feature of new Crystal Lake plant of Consumers Co. Low per-ton cost and flexible operation, a 6000-cu.-yd. surge pile separating pit and plant operation, a screening section in which all materials are double-washed, and a large capacity blending and reclaiming system all contribute to accurate gradation and a better product in meeting any consumer specification requirement.

High-Capacity Kansas Stone Plant

A 1,000-t.p.h. plant of Concrete Materials and Construction Co. has been set up to produce 1,500,000 tons of base material for the Kansas Turnpike in a period of seven months. This high-production crushed stone plant has an extensive layout of radial stacker and tunnel conveyors to meet close specification tolerances and handle a large volume of material. Plant operates around the clock.

Modernized Industrial Sand Plant

Foundry sand is being produced to specifications of AFS-100 and higher at this modernized plant of Millville Silica Sand and Gravel Co. in New Jersey. Equipment has been added to increase production of three major types of foundry sands, and also several specialties, including sand-blast products. Raw material is excavated by dredge.

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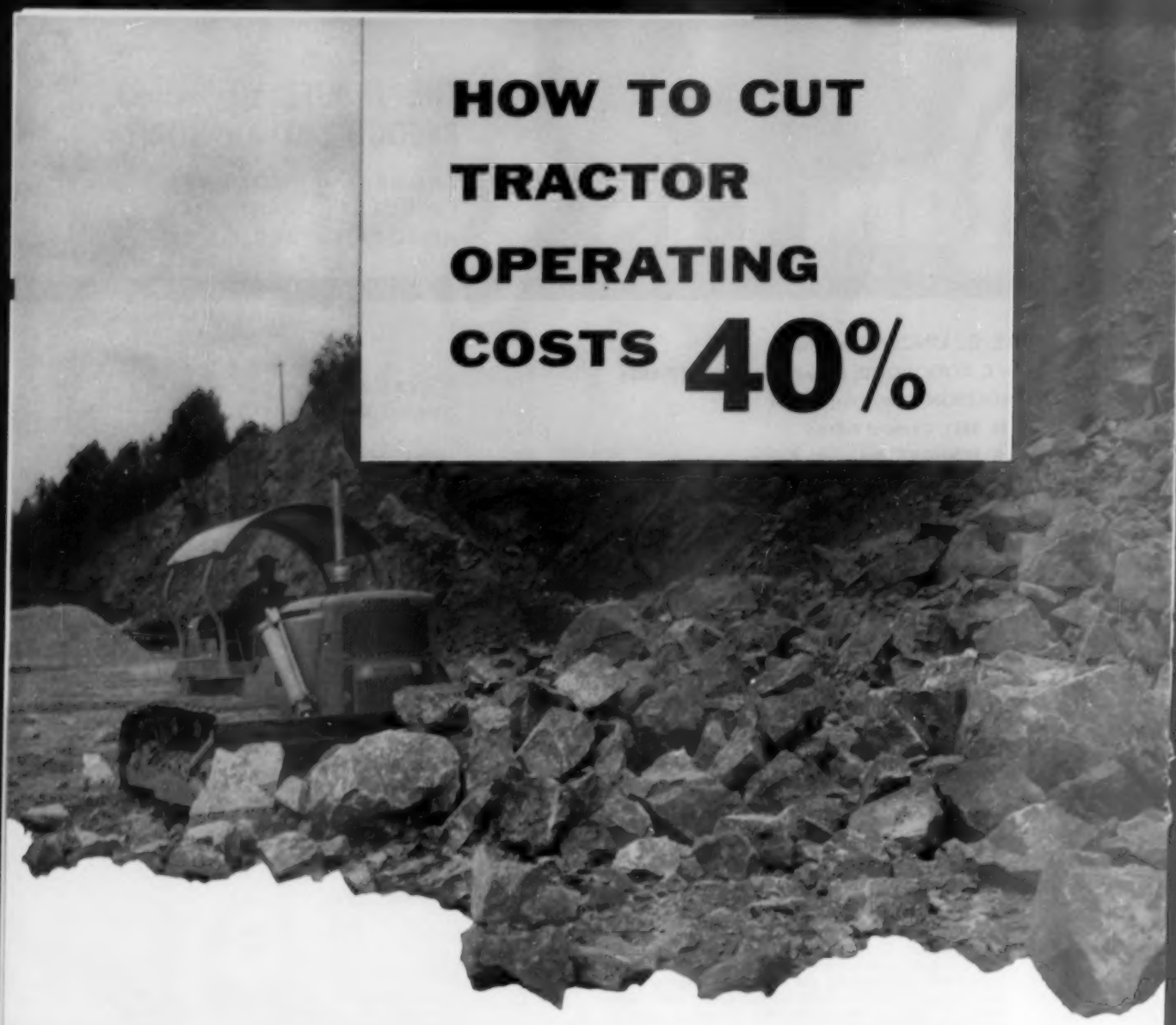
HOW TO CUT TRACTOR OPERATING COSTS 40%



THIS new Caterpillar D7 Tractor (Series C) replaces another D7, veteran of 14 years of tractor-busting work in the quarry of Olympic Portland Cement Co. at Limestone, Wash. The old D7 it replaces cost a total of $29,669.31 for all running expenses, upkeep and repair during 14 years on the job. This is three times its original cost. According to Joe Ristine, Quarry Superintendent, the usual figure in this rough work is five times original cost. A clear saving in this case of 40%!

With its No. 7A Bulldozer, Olympic's new D7 clears shot rock from the quarry floor, cleans up around the shovel, and maintains haul roads. Rugged work—but this new CAT* Diesel Tractor is designed to handle even *more* jobs at even *lower* cost than its sturdy predecessor. Its heavy-duty diesel engine develops 128 HP for bigger, more profitable loads. The injection system delivers full, foul-free power on money-saving No. 2 furnace oil.

This new tractor is available with an oil clutch for longer life and greatly increased periods between clutch adjustments. Track shoes are now hardened by a new "water quench" process to stand up under severe quarrying conditions. Hydraulically boosted steering and new starting engine with easy single-lever control are popular with operators.

The new D7 is available with straight or angle blade, with hydraulic or cable control. Your Caterpillar Dealer will be glad to arrange an on-the-job demonstration of the D7 or other Caterpillar Diesel Tractor that will work most, last longest and cost least on *your* job. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

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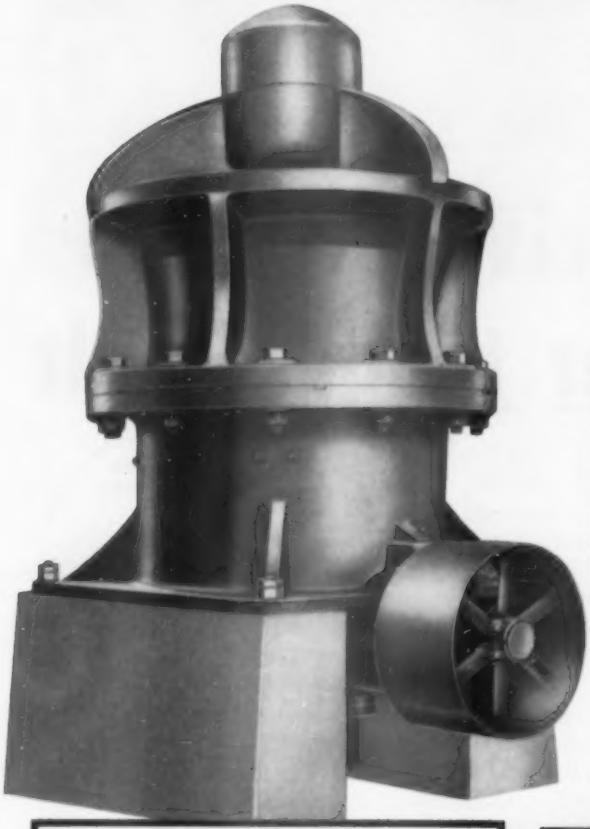
IN MORE THAN 806 INSTALLATIONS



For over a half century Traylor has been designing and custom building heavy-duty machinery to help stone producers achieve more efficient and profitable production. As a result, there are today more than 806 Traylor Reduction Crushers operating in installations throughout the world . . . a large percentage of them in the rock products industry. The Reduction Crushers we are building today incorporate many exclusive design features developed by Traylor Engineers as the result of this long-standing, intimate knowledge of special rock crushing problems.

Traylor original Curved Concaves and Bell Head apply power as a direct crushing force. As a result, lifting and churning of material in the crushing chamber is greatly reduced to keep waste fines to a minimum . . . to produce greater quantities of a more uniform, cubical product on the first pass through the crusher. Traylor curved crushing surfaces reduce choking and packing because each succeeding zone in the crushing chamber is of greater capacity than the one before it. This results in much greater production at an amazingly low cost per ton produced.

Traylor Reduction Crushers are available in six sizes with feed openings from 3" to 22". Send for Bulletin #8112 containing complete description, illustrations and specifications.

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821 MILL ST., ALLENTOWN, PA.
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These Traylor features insure maintenance economies to match the extra production efficiency of Traylor TY Reduction Crushers.

* Bronze Bushed Eccentric promises long, trouble free service.
* SPRING MOUNTED SUSPENSION affords protection against tramp iron.
* Auxiliary outside lubricating system includes pump, cooler and filter.

Traylor **REDUCTION CRUSHERS**

Intense heat no problem for Super Belts

This hydraulic press at Hackney Iron and Steel Co., Enid, Oklahoma, shapes red hot steel plate into tank heads.

The flat leather belt formerly used on this type of press, would stretch, slip, and come off. Tightening the belts only overloaded the bearings. For this press, a Gates Super Vulco Rope drive was chosen because it withstands the near-by intense heat, and its extra horsepower capacity permits lighter weight sheaves; thereby reducing load on bearings.

Claude King, maintenance superintendent, reports: "This Gates V-belt drive has operated 8 hours a day for 5 years without lost time due to maintenance."

Super Belts on vibrator last 7 times longer

James Gann, general superintendent of John B. LaGarde, Inc., Anniston, Alabama, reports:

"Practically every condition exists to shorten V-belt life on the vibrator drive of this concrete block machine. The machine starts and stops 4 times a minute. Intense vibration must be absorbed by the V-belts to protect motor and bearings. Sand and concrete, oil and grease all get into the drive.

"With Gates Super Vulco Ropes, we get about 7 times the average life we received from any other make. It is hard to believe that belts can take this punishment, but Gates Super Vulco Ropes do it."

Solve tough drive problems with this super tough V-belt

If present V-belts are wearing out too fast . . . if heavy shock loads . . . oil and heat . . . or other conditions are causing too frequent replacement . . . here's the answer:

Gates Super Vulco Rope—the oil and heat resistant V-belt with 40% more horsepower capacity. Easily handles heavy shock loads.

That means longer V-belt life and *cost savings two ways*—savings on belt replacements and savings on maintenance down-time.

Let a Gates V-Belt specialist help you solve *any* tough drive problem. He'll make recommendations without obligation. Gates offices and distributor stocks are listed in the phone book yellow pages in all major industrial centers. The Gates Rubber Co., Denver, Colorado—*World's Largest Makers of V-Belts.*

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TPA 104

Gates SUPER VULCO ROPE Drives

with Gulf Lubricants and Fuels

on the job at Macon Quarries, Macon, Georgia

Helping quarry operators keep equipment working smoothly and efficiently is an important part of Gulf's business—made possible by a complete line of high quality lubricants and fuels, plus practical petroleum engineering service.

Gulf lubricants provide an extra margin of protection—prevent excessive wear and keep maintenance costs down. Gulf fuels burn evenly and completely—leave fewer harmful engine deposits and contribute to top engine performance.

And Gulf Sales Engineers are always available to assist you on any problem involving a petroleum product. Try this crack combination of quality products, helpful engineering counsel, and prompt delivery service in your operation.

Consult the telephone directory for the number of your local Gulf office, or write on your company letterhead to the address below.

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for fine pulverizing and classifying with easy fineness control.

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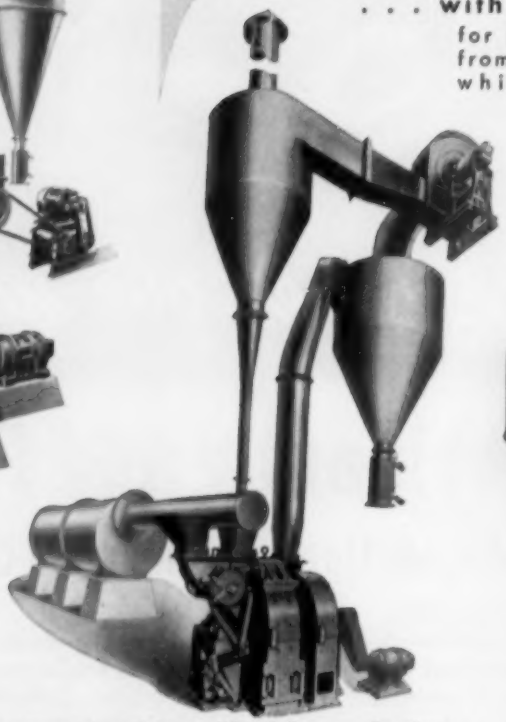

. . . with STANDARD EQUIPMENT
for use in various combinations.

IF you are under pressure to achieve still higher production . . . or if you have a special pulverizing problem that requires a quick solution . . . then this versatile Imp Mill may be just the right answer.

It is a compact unit that will fit readily into your plant layout and provide an economical installation for handling a variety of jobs simply by different arrangements of the equipment.

It offers scores of uses in the non-metallics industries:— For disintegrating, blending and classifying materials to make uniform, intimate mixtures . . . for grinding and drying in one operation . . . for making extreme fine powders in combination with a Raymond Mechanical Air Separator, or removal of fines for producing granular materials with supplementary screen separation.

Tell us your requirements in capacity and type of materials you produce . . . and Raymond engineers will be pleased to make specific recommendations.

Ask for Raymond's new Imp Mill Bulletin No. 77.

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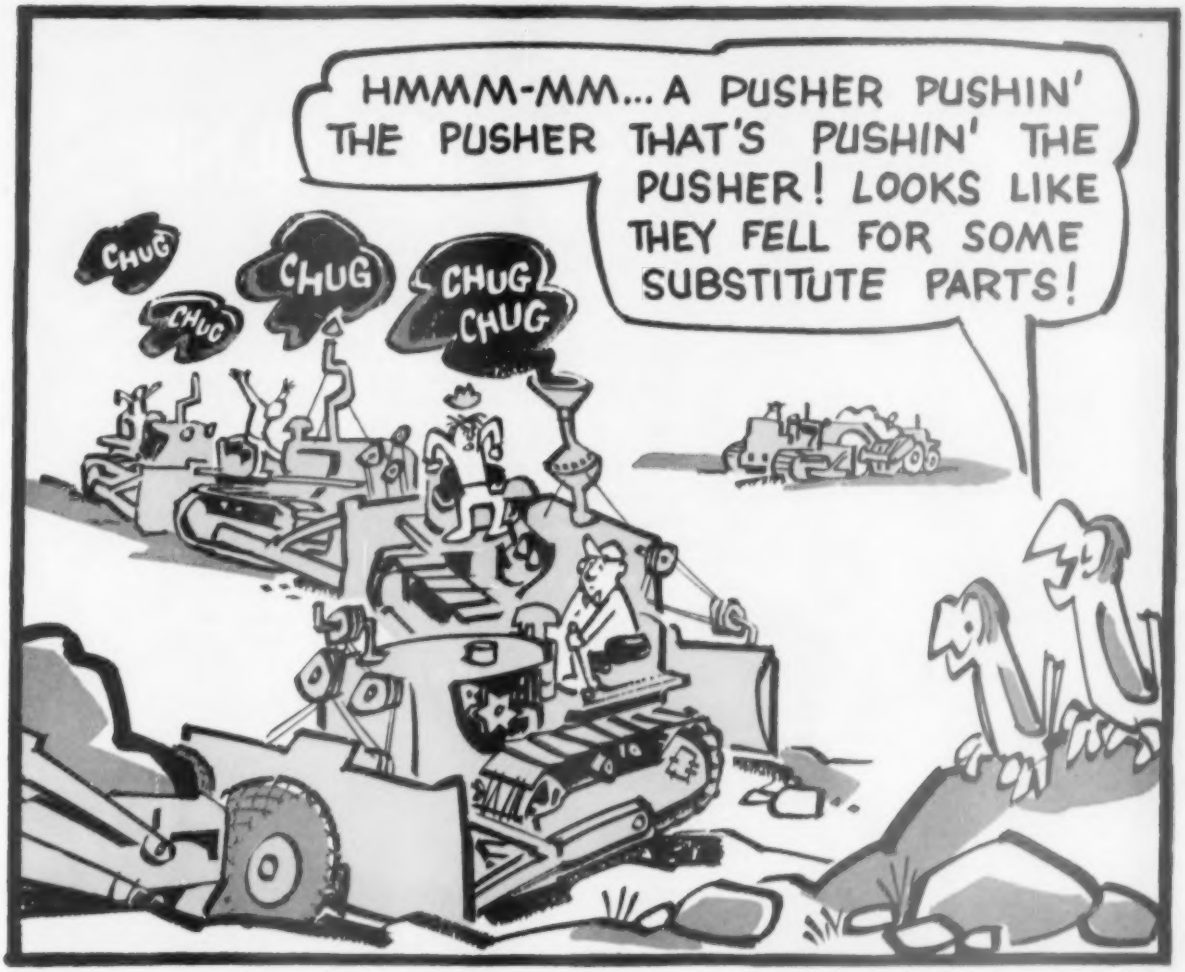


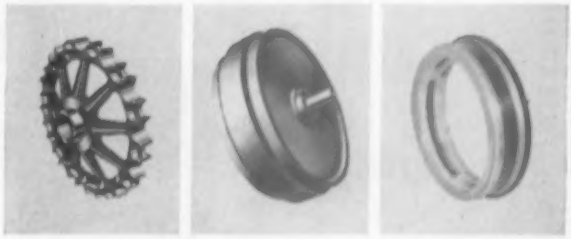
Anybody ever tell you there's no difference in parts?

Take sprockets, for example. Caterpillar *original* sprockets feature *deep-hardened teeth* with tough cores to withstand shock loads. CAT* original idlers have steel disc construction, with steel treads *flame-hardened* for greater wear. Cat bellows seals are of self-aligning face-type design. They help keep lubricant in and dirt out, even on the dustiest job. You're *sure* of new machine performance with original parts like these.

With substitute parts, can you be sure of anything?

Better see your Caterpillar Dealer's Parts Representative—and get Cat original parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.



Caterpillar sprockets, idlers and seals are the result of over 50 years of track-type tractor manufacture. So don't be fooled—there is a difference in parts. Why take chances with substitutes?

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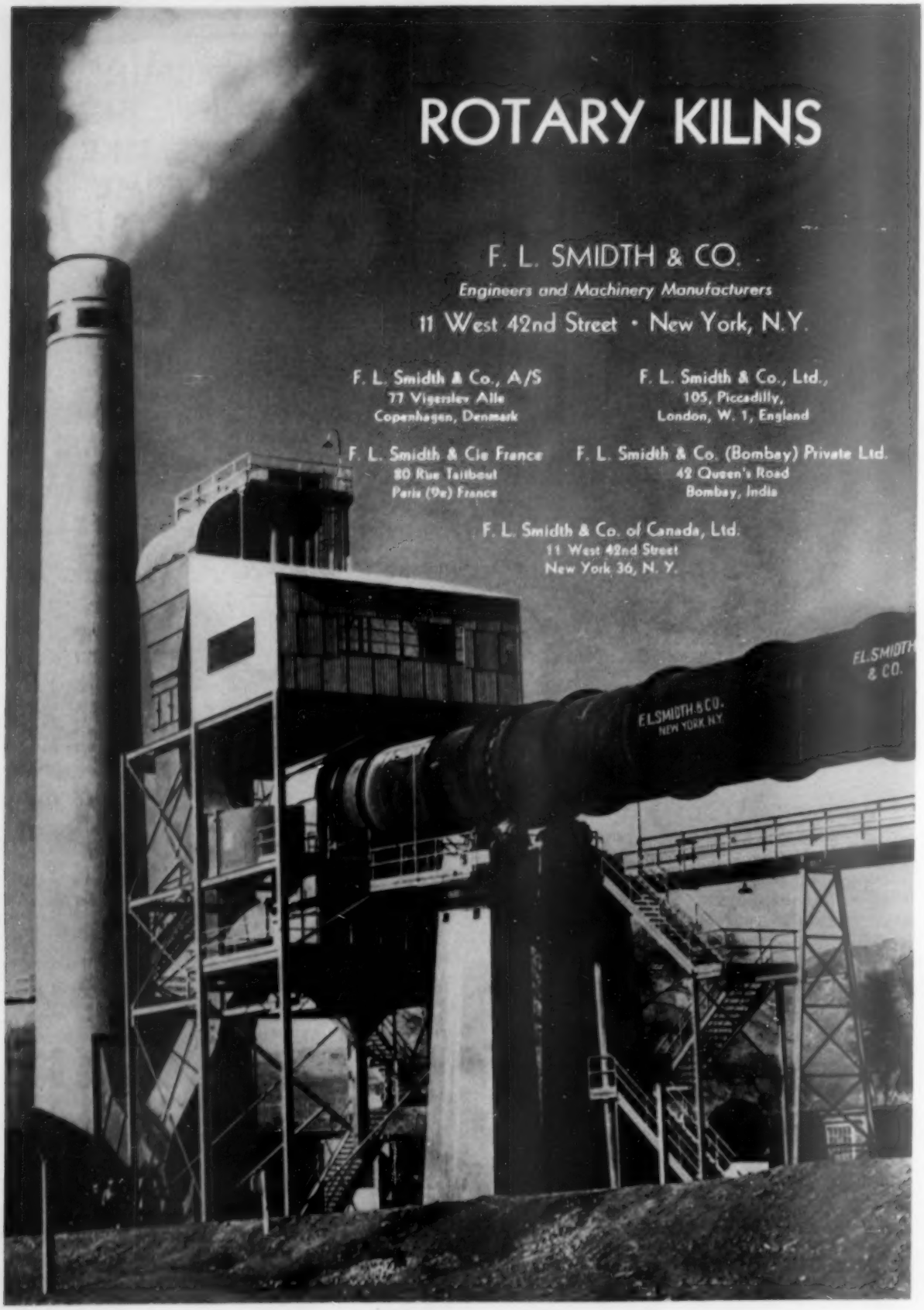
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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

July, 1956

Eastern farmers in the United States are taking to irrigation, a familiar crop-booster in the arid West but new, and a bit surprising, in the well-watered East. The irrigation boom started in 1951, when abnormal drought cut farm yields, and was continued when it was found to result in higher volume and net profits. In the 31 states east of the Great Plains, where rainfall averages 40 to 50 inches a year against 10 to 20 inches in the West, irrigated crop acreage now amounts to 2.6 million acres, an increase of 72 percent from four years ago. It is still less than a tenth of the West's 26.9 million irrigated acres, but the rate of increase in the dry states was only 10 percent in the same period.

A process of soldering cans — margin plating — has been announced by the American Can Co., which, according to the company, will eliminate almost all tin from an estimated 10 billion cans. The process calls for plating only the narrow margins of the steel plate that form the soldered sideseams of the cans, approximately $\frac{3}{16}$ in. thick. The company expects to save as much as 5,260,000 lb. or 2600 tons of tin annually. Annual tin consumption in the United States is about 80,000 tons. The tinless cans can be used for motor oil, anti-freeze, solutions, polishes, waxes and cosmetics, as none of these products are heat processed during the canning operation.

A Cuban firm, Compania Cubana Primadera, S. A., was recently granted a loan of $1,500,000 by the U. S. government's Export-Import Bank, to help build a plant for manufacturing hardboard from sugar cane bagasse. Until now, bagasse has been used for low density soft board and insulation. The new plant expects to process bagasse for such products as hardboard, tileboard, and decorative panels. A principal use of the hardboard output will be for making concrete forms.

Revolving drum, concrete mixer trucks are being utilized by the Chicago Transit Authority for placing crushed stone ballast in track road beds for the construction work currently underway for the west side subway in the median strip of the Congress Street Expressway. The C.T.A. has also used transit-mixers as snow fighting equipment, spreading sand and salt, and plowing snow.

Bricks made with a mixture of dirt, asphalt and rice hulls may contribute to the building of inexpensive farm houses in India. An agricultural engineer at the University of Louisiana, John H. Housh, developed the brick, which has also been tested for possible use in building atomic bomb shelters, and appears to be holding up well in atomic fallout tests.

The silicone industry, now at an estimated $40,000,000 a year, may reach a $50,000,000 per year level within the next few years, as additional products have been added to the over 200 developed in the last 10 years, according to a report in **Chemical Week.**

A National Committee for the Development of Scientists and Engineers was established by President Eisenhower early in April, according to a report in **Mining Engineering.** The committee was established to "foster the development of more highly qualified technological manpower," and is composed of 19 leaders in engineering, science, education, management, labor, state and local government, and the humanities. The new committee is expected, by presidential direction, to enlist cooperation "in analyzing the problem and developing programs to deal with it, and to take the lead in coordination of interested organizations outside the Federal Government."

Home building prospects under the Veterans Administration's mortgage guarantee program improved seasonally in April. Requests for appraisals on proposed construction increased to 45,769, an increase of 22 percent over March, but 31 percent below April, 1955. Building under the V. A. program is considered to be the most "volatile" segment of the housing picture. It was largely responsible for 1955's high volume of home building—1.3 million units, according to the **Wall Street Journal.**

Pre-historic deposits showing evidences of human cultures for several thousand years, represented in beds of clay in stratigraphic order, have been discovered at a sand and gravel deposit in Portales, N. Mex. Dr. Fred Wendorf, research associate, Museum of New Mexico, Sante Fe, has requested that the site be preserved "for future generations of scientists who have developed techniques that we do not now have."

Heavy construction awards, nationally, totaled $9,179,147,000 for the first 21 weeks of 1956, which was an increase of 22 percent above the corresponding period in 1955, according to **Engineering News-Record.** The cumulative total for public works construction was $3,372.1 million, 19 percent above 1955. United States highway contracts are 20 percent above last year for the country as a whole.

Scoria is processed by United Pumice Supply Co., Inc., at Tulelake, Calif., and cut to standard size bricks for scouring cooking surfaces in restaurants and coffee shops. The scoria bricks are also used by farmers in scouring rust from implements, and by house painters for smoothing surfaces. Occasional carloads of waste fragments are shipped to wineries or vinegar plants for use in filters.

Southern Pacific railroad researchers have discovered that locomotives need drop only half a pound of sand per minute at each wheel to get the most effective grip on the rails. Up to now they have been dropping as much as 5 lb. per minute.

Communist Czechoslovakia is building and equipping a cement plant for Egypt at Helwan, near Cairo. The contract was won by the Czechoslovak export-import organization "against western competition," as reported by the news agency Ceteka.

An Illinois schoolteacher wants to buy a gravel pit from Winnebago County as a conservation project for her school classes. She stated her interest in conservation work, and hopes "to get my students interested in having some practical experience with this project."

THE EDITORS

"The EAGLE sand screw with coal removing attachment has been working satisfactorily for the past 2 years"

A large sand and gravel company, operating a number of plants in Illinois, encountered difficulties from coal in their deposit at one of their plants.

Several years ago they installed an Eagle Double Screw Coarse Material Washer-Dewaterer with *Coal Remover Attachment* which solved their problem by removing 98% of the coal from -⅜" +⅛" material according to their report.

If coal or lignite in your material is preventing you from meeting specifications, investigate the Eagle Screw Unit with Coal Remover Attachment—actually gets out the coal at lower cost than more expensive, complicated equipment. Does a thorough washing job too. If shale, chips, or water logged debris are your problem, there's an Eagle Shale Remover or Trash Remover attachment to solve your problem.

Send a 25-lb. sample of your material—let experienced Eagle Engineers run a test, give you a report and make recommendations without obligation. Eagle pioneered in the design and construction of aggregate washing and classifying equipment—has the "know how" to solve your problem and the equipment to do the job—*plus* a nationwide network of Factory-Trained Distributors.

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COARSE MATERIAL WASHERS

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WATER SCALPING—CLASSIFYING TANKS.

"SWINTEK" DREDGE LADDERS

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BREAKER BALLS & PILE HAMMERS.

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*Users name on request.

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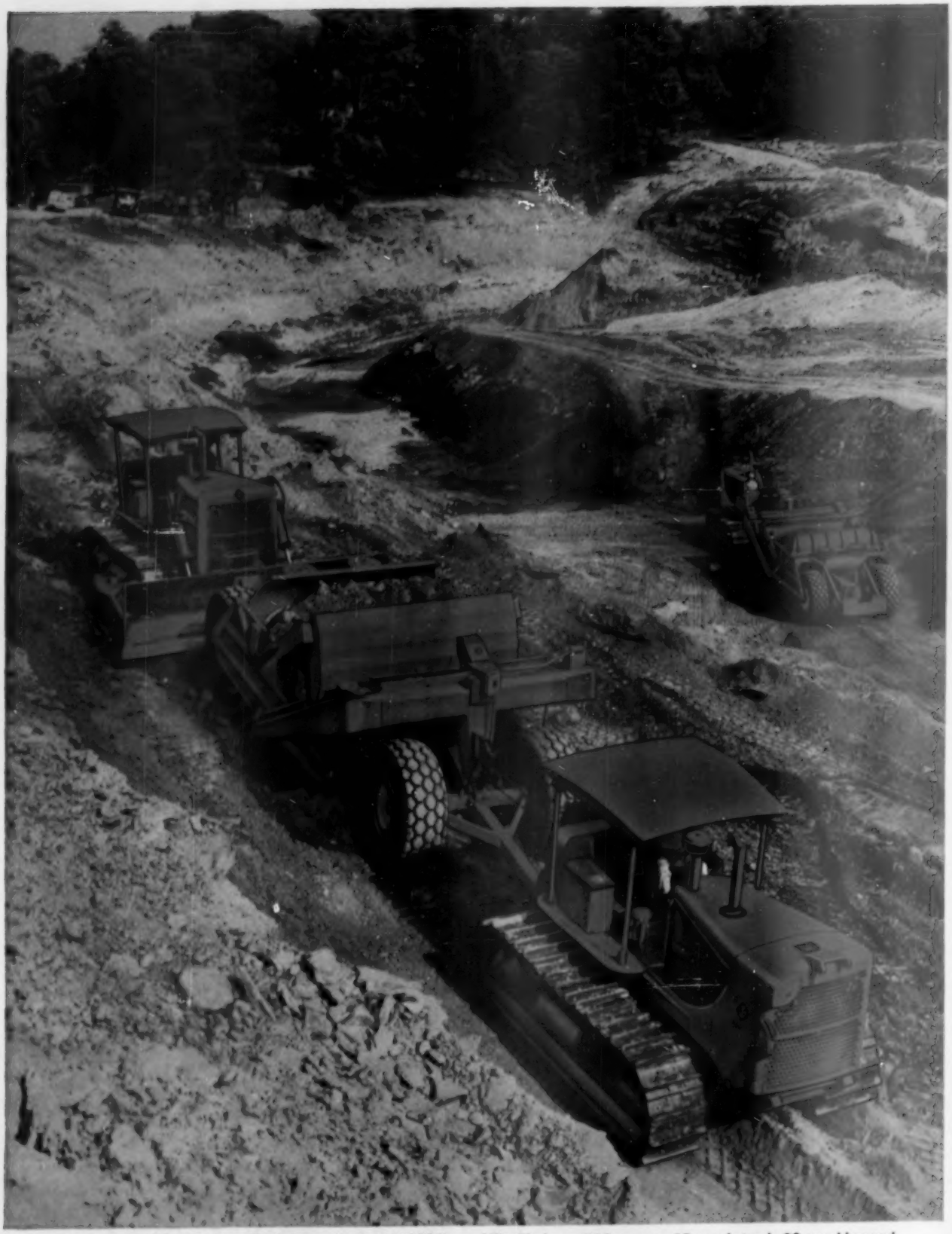

Allis-Chalmers HD-21 Tractor; 204 net engine hp; 44,000 lb. • Allis-Chalmers 315 scraper; 15 cu yd struck, 20 cu yd heaped.

This Allis-Chalmers HD-21 is general handy man at the Furr Coal Company's mine. It builds and maintains incline ramps between cut and fill areas to provide short haul cycles. With rear-mounted ripper, it loosens overburden when necessary to insure continued, fast loading. It also acts as a stand-by pusher.

Two Allis-Chalmers HD-21 tractors and pull-type scrapers strip overburden, carry it down an incline and spread it in a worked-out section of the mine and return empty up another ramp. By this method, the Furr Coal Company reclaims land without rehandling material. Savings amount to 8¢ a ton or roughly $1.50 for every scraper load.

You can strip overburden and reclaim land *in One Operation*

with Allis-Chalmers crawler tractors and pull-type scrapers

Whether you are stripping iron, coal, clay or quarry stone, you are probably faced with the problem of reclaiming the worked-out land. This is where mobility of Allis-Chalmers tractors and pull-type scrapers is of real value. With this equipment, you can strip overburden from new deposits, then haul and spread it immediately in a worked-out section of the mine.

A typical example is The Furr Coal Company, Nelsonville, Ohio. On this operation, HD-21 tractors and Allis-Chalmers pull-type scrapers save an estimated cost of 8¢ a ton by eliminating a second handling of overburden. Overburden consists of earth and clay with very little rock. The big HD-21's have the power to load these 20-yd. scrapers—usually without a pusher—and the speed to complete the cycle quickly.

"I've owned other makes of tractors and scrapers," says Mr. Furr, "and I have these because I believe them to be the best." Mr. Furr likes the Allis-Chalmers diesel engine, the construction of the tractor and the fact that it has proven torque converter drive. He also estimates that its thousand-hour lubricating intervals save about 30 minutes' servicing time every shift . . . "and this really adds up to important savings."

Find out how Allis-Chalmers equipment can bring new efficiency to your stripping and reclamation work. See your Allis-Chalmers Construction Machinery dealer.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

NO "TIME OFF" IN EIGHT YEARS

Working 40 hours a week the year around, the CAT* D13000 Engine in this 1½-yd. Marion shovel has had *no major repairs in eight years.* It provides steady, dependable power for loading out 700 tons a day of limestone cement rock for Ideal Cement Company at its quarry near Northport, Washington. This operation was formerly under direction of Spokane-Portland Cement Co.

Now there is a successor to the D13000. It is the new Caterpillar D342, which can produce more power (210 HP—maximum output capacity) from the same engine size. And it has the traditional advantages of rugged four-cycle Caterpillar construction. There are no air boxes or cylinder ports to clean in Caterpillar Engines. Their Caterpillar-built fuel injection systems need no tinkering, and remain free from fouling even when the engine idles for long periods of time. And—a money-saving "plus"—all Caterpillar Engines can deliver full power on non-premium furnace oil.

These trouble-free diesels have such features as "Hi-Electro" hardened crankshafts with Superfinished bearing surfaces, aluminum alloy bearings, and effective fuel, air and oil filters to keep out engine-wearing abrasives. Leading manufacturers install Caterpillar Engines as original power in their equipment. And your Caterpillar Dealer can install one of these sturdy yellow engines in your present equipment.

Your Caterpillar Dealer has all the facts and figures on the broad Caterpillar line of engines capable of producing up to 650 HP (maximum output capacity). See him for *proof* that a Caterpillar Engine or Electric Set can do *more* work for a *longer* time at *lower* cost on *your* job. And count on him for trained service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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MODERN
HEAVY-DUTY POWER

READY FOR EXPANSION...

It's no secret that highway and other building programs of the next four years will require tremendous expansion in the Rock Products industry if the demand for materials is to be met. The question is, can the Rock Products industry meet that demand?

One of the most authoritative groups on the question is convinced that the producers of our industry can do it—that they have the ability to handle the job in all of its phases. Temporary short supplies of cement, plus isolated spot shortages in other materials, are expected to be overcome maybe by next year. The current planned expansion of material production facilities is expected to take care of it.

So says the Task Force Reports, prepared by the American Road Builders' Association in April this year. The full report, titled "The Highway Construction Industry in a Long-Range National Highway Program", is an excellent study on projection of future production capacities of the industries concerned with highway construction. Much credit is due the Association and its four Task Forces for so thoroughly digging into long-range industry expansion problems. Task Force No. 2, headed by A. T. Goldbeck, engineering director for National Crushed Stone Association, had the job of covering "Materials and Supplies", which concerns the Rock Products industries.

The problems attacked by Task Force No. 2 was to determine the needs of a proposed national highway program in terms of materials, then to survey the industries involved to learn how production could be balanced against those needs. Based on a national road-program level of $4.6 billion in 1955, the group thought it possible to supply a level of $7 billion in 1956, $8.3 billion in 1957, $10 billion in 1958 and $11 billion in 1959. This means an increase in the program dollarwise of 140 percent in four short years.

Even though it is believed that materials will be available to satisfy such a mushrooming program, the projected job in production is large enough to be frightening. The cement industry supplied 62 million barrels for highway construction (including concrete culvert pipe used) in 1955. That amount was 21 percent of all cement production. If the program goes as planned, 1959 cement requirements on the same basis would be 177.6 million barrels. That's an **increase** of 187 percent in four years, or an average of 47 percent per year.

The 1959 cement needs for roads would amount to 44.5 percent of the projected industry capacity at that time, leaving only about 222 million barrels for non-highway construction. The calculated data show that the Task Force report may be optimistic, but it explains that the cement industry has taken definite action by speeding up expansion programs. From May through October, 1955, production was at an annual rate of 328 million barrels, or 5.3 percent ahead of projected annual capacity for the fourth quarter of that year.

The need for aggregates to satisfy the proposed expanding road program will grow similarly. According to the report, there is no question that the aggregate production industry can support the anticipated increases in the highway program. Output of all aggregates—crushed stone, sand and gravel, slag—amounted to 821 million tons in 1955. Of that, 403 million were used in roads.

By 1959, if the level of the planned road program set by the Task Force be followed, road needs for aggregates will be 892 million tons—**more than double** the entire 1955 output. It's a large order, but prospects of its achievement are bright. The report points out that a survey of crushed stone producers shows an ability to increase output 109 percent by 1959. That increase alone would bring the road program level to $8.7 billion for that year. The output of sand, gravel and slag is expected to grow likewise, so no problem in supply is evident for the long pull.

There will be no difficulty in the supply of bituminous materials. Output by that industry is flexible and could be doubled with little difficulty. A doubling in output would provide more than twice the increase in production needed for an $11 billion highway program, slated for 1959.

One of the major advantages to industry of reports of this type is that of being able to balance expansion with projected needs. Capital thus is spent wisely, material price levels are not affected adversely, and materials can be made available when and where needed to satisfy the needs of progress. ARBA and its hard working groups are congratulated for their contribution to the Rock Products industries and to the nation.

George C. Lindsay

more yards per load

Gets More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back *at ground level* gets BIGGER LOADS with less spillage.

Keeps More

Heaped loads are cradled closer and lower for greater stability while carrying. Hydraulic system shock-absorber also cushions the load, smooths the ride, and permits faster movement with less spillage.

Delivers More

Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result—you *deliver* more yards per load and more loads per hour.

The new model HO is the finest four-wheel-drive tractor-shovel ever offered. It has *everything* that has proven desirable in modern tractor-shovel design, including important new and exclusive features: torque-proportioning differentials; no-stop power-shift transmission; powerful 40-degree bucket break-out action; "stay-clean" hydraulic system; greater dumping height and reach; longer wheelbase; shorter length while carrying.

This big "PAYLOADER" operates easier and faster and rides smoother, with or without a load, than anything near its size. It has *balanced* design and durability throughout to turn out big production day after day. If you want proof of its *productive capacity* and superior *performance,* ask your "PAYLOADER" Distributor for a demonstration.

more loads per hour

Loaded with "more-yardage" features

- **Torque proportioning differentials** — an exclusive "PAYLOADER" feature—increase effective traction. If one wheel begins to spin because of poor traction, more power is delivered automatically to the other wheel.
- **"No-stop" power-shift transmission,** with torque-converter, can make ALL shifts on-the-go under full engine speed. There's no stopping for a range shift and no "clutching". Operator can "inch" the machine with forward-reverse control while maintaining full engine speed to provide maximum bucket lifting and dumping power.
- **All-power control** also includes power brakes on all wheels, and power steer to further reduce operational fatigue and promote full production all day.
- **Rugged planetary final drives** in all wheels, plus hypoid differential gearing keep torque low in axles—prolong life of drive train parts as well as axles.

Safety and Stability

The safest and most stable wheeled tractor-shovel ever built. Moving members cannot injure operator because of underslung boom arm design and positioning. With loads carried lower and closer to the machine, cushioned during travel, and with longer wheel-base the utmost in stability is achieved.

THE FRANK G. HOUGH CO.
705 Sunnyside Ave., Libertyville, Ill.

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☐ model HO	☐ model HH	☐ model HH
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The BIG SCREEN for the BIG JOBS

ALLIS-CHALMERS SCALPING SCREEN

- **Engineered to Handle the Toughest Job in Any Rock Products Flow**
- **Extra-Large Mechanism**

HERE'S an *extra heavy duty* screen built to take punishing loads coming from your primary crusher. Its rugged cartridge-type, oil-lubricated mechanism features giant bearings — the largest ever installed in a vibrating screen. The heavy I-beam and channel-constructed screen deck support frame can withstand impact of large pieces and high tonnage.

Reduced Maintenance — Simplified two-bearing cartridge mechanism can be pulled out after removing sheave and four bolts. Large size bearings mean extended life, less frequent replacement.

Vibration Isolation — Standard design includes multi-unit vibration *isolators* — two per corner, each with an inner and outer spring arrangement. Vibration to building or structure is isolated even when sticky materials adhere to the screen.

FIELD TESTED FOR 3 YEARS

For complete information, see your A-C representative or write for Bulletin 07B8368, Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5063

KENNETH A. GUTSCHICK

Arbitration Ruling Favors Cement Co. in Overtime Work Dispute

A DISPUTE OVER SATURDAY OVERTIME WORK was arbitrated recently in favor of the producer—Standard Lime and Cement Co. (Woodville, Ohio, plant). The case, submitted by United Mine Workers of America, District 50, Local 12965, involved two sections of the labor contract—one dealing with assignment of overtime and the second with the pro-rating of overtime within a department on an annual basis. Availability of the employee for overtime work was the key question, and it was ruled that "the employee who had moved without notifying the employer of his new address or telephone number was not an 'available' employee for Saturday overtime work within the meaning of the contract which provided that opportunity to work overtime shall be offered to an available employee within the department in which the overtime occurs. Employer did not violate contract therefore by assigning this work to an employee of another department without attempting to contact employee who would have been entitled to the work had he been available".

The dispute was decided by a single arbitrator, Harry J. Dworkin, the hearing being held April 24, 1956. What follows is taken from the arbitrator's report.

Background

"The grievance involves William Johnson, who was a regular employee in the Special Department classified as a truck driver. On February 4, 1956, an employee of the Refractory Department was assigned to perform four hours of overtime work as a truck driver in the Special Department, which overtime work is claimed to have properly belonged to the grievant, who the union asserts was available and therefore was entitled to the job. As a result he claims to have lost four hours overtime pay and seeks reimbursement.

"The specific provision of the contract governing assignment of overtime work, upon which the union relies, is as follows:

Article V Seniority, Section 7(b):

'If overtime is required in any department the company will offer the work to an available employe of the department, but if any employee at the plant qualified to do the required work is available on straight time, then the company shall have the right to assign the work to the employee who will be working on straight time.'

"The company urges that this dispute must also be considered in light of the provision requiring equalization of available overtime hours among employees in each department who are qualified to perform the work as set forth in Article VIII Work Week, Overtime Work and Pay, Section 6:

'Overtime and double time hours will be divided as nearly equal as is practical, from time to time, among employees in the department who are qualified to perform such work. It is recognized that overtime cannot always be offered to the man entitled to the same, at the time overtime is needed, but the company will attempt insofar as practical to equalize the same during the one year term of this contract. If overtime is offered and refused, then said employee who refuses the overtime will be credited, for overtime equalization purposes, with having received overtime for the hours offered.'

Position of the Union

"The union claims that Johnson was an employee in the Special Department, classified as a truck driver, and as such should have been assigned to the overtime work in that department on the day in question. Since he was available and was not called, he has been caused to suffer a loss of four hours at overtime rates.

"The company, it is asserted, was in violation of the contract in assigning such overtime work to an employee in the Refractory Department, and, it is the union's desire to discourage the practice of assigning overtime work in one department to employees of another department when qualified employees are available in the former department.

"In accordance with the union's construction of the language used in Section 7(b), the company is permitted to avoid payment of overtime by assigning work available in any department to any qualified employee in the plant who has not had forty hours of prior work in the plant, and that such assignment may be at straight time rates. However, such overtime work at overtime rates may not be assigned to an employee of *another department* who has worked forty hours during the week, since it must be offered to an employee available in the department where the overtime work is required. Under such circumstances the company may not reach into the Refractory Department, or any other department, and assign a truck driver from that department to the Special Department for overtime work. However, such employee may have been properly assigned if he were available at straight time rates.

"With reference to the 'equalization of overtime' provision, the union urges that it is not applicable to this factual situation for the reasons that a specific provision of the contract has been violated, the four hours offered by the company subsequent to the grievance to equalize the overtime hours 'lost' by the grievant was in another department, and that this provision was not designed nor intended as a saving clause to excuse proper compliance of the contract applicable to overtime work in a particular department. Accordingly, the union asserts that Section 7(b) should be construed and applied separate and distinct from the overtime equalization provision.

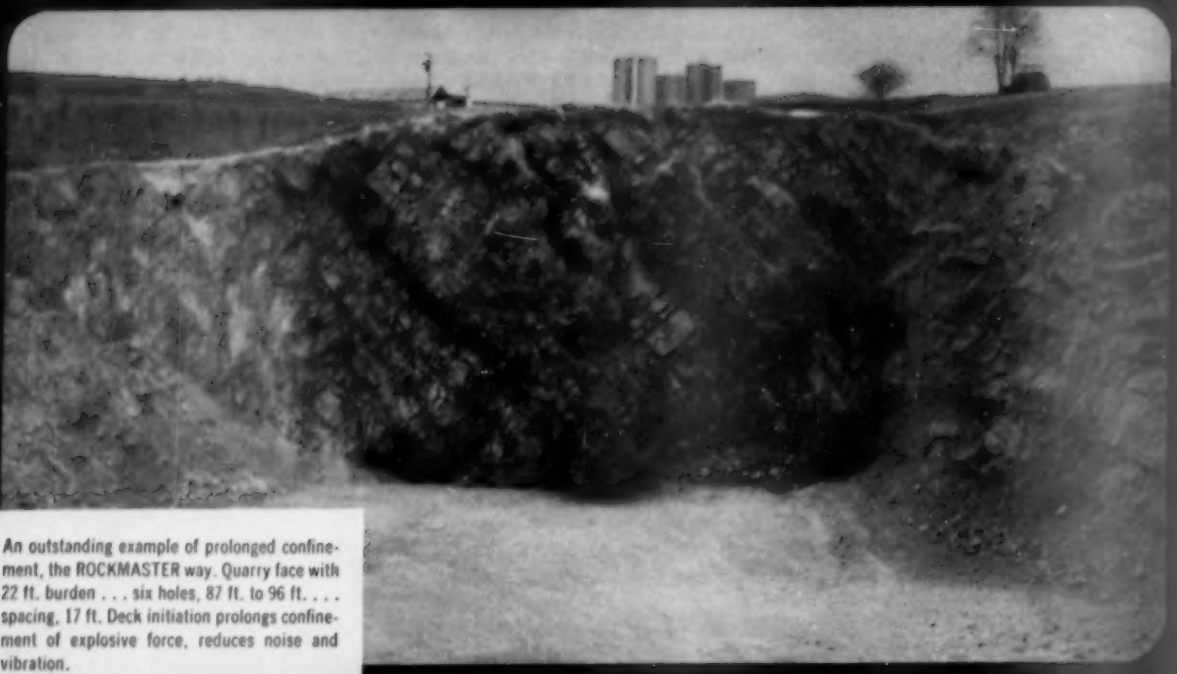
Position of the Company

"The company states that on the day this grievance arose one additional truck driver was required in the Special Department and that the foreman assigned the work to an employee from the Refractory Department for the reasons that at the time there were no other truck drivers available in the Special Department and the grievant Johnson was not scheduled to work that day. No effort was made to contact Johnson since he had recently moved and his new phone number was not known; also it was not known in advance how much time would be involved. Under Article VIII Work Week, Overtime Work and Pay, Section 3, if an employee had been summoned from his home, he would have been entitled to four hours work or pay at the applicable rate, even though the job would have been completed in less than four hours. Under the circumstances the foreman did the 'practical thing' in obtaining a qualified truck driver from the Refractory Department.

"Subsequent to this occurrence the company offered to provide the grievant with an equal amount of overtime work in accordance with Article VIII, Section 6, requiring that overtime be divided as nearly as practical among employees in the department who are qualified to perform the work. This offer of settlement was refused and the demand was made for four hours overtime pay, even though the hours

(Continued on page 114)

PROLONGED CONFINEMENT COUNTS



An outstanding example of prolonged confinement, the ROCKMASTER way. Quarry face with 22 ft. burden . . . six holes, 87 ft. to 96 ft. . . . spacing, 17 ft. Deck initiation prolongs confinement of explosive force, reduces noise and vibration.

Control is excellent. Blast "pushes" burden evenly . . . fragmentation is just right. Note absence of wild flying rock. And there are no fountains of wasted gases.

DOUBLE DECKER BLAST...

and the baker's dough stayed up!

This muffled ROCKMASTER® blast combines the important elements of good breakage and good public relations! Here at the Bradford Hills Quarry Company, Norristown, Pa., 17,000 tons of rock were uniformly broken and evenly displaced with a minimum of noise . . . and seismic readings at a nearby bakery showed no harmful vibration.

Secret of this desirable result is *prolonged confinement*. This 6-hole blast was initiated at the bottom of two decks with ROCKMASTER millisecond delay electric blasting caps. The bottom deck of each hole was detonated a period ahead of the top deck, and this pattern worked progressively along the face from left to right—taking advantage of the pitch of the rock. This perfect combination of ROCKMASTER blasting caps and Atlas Explosives assures—

- **good control**
- **improved breakage**
- **greater efficiency**
- **better public relations**

You can benefit by discussing prolonged confinement with your Atlas Representative. Write, too, for "Better Blasting"—Atlas' informative newsletter on latest methods and materials.

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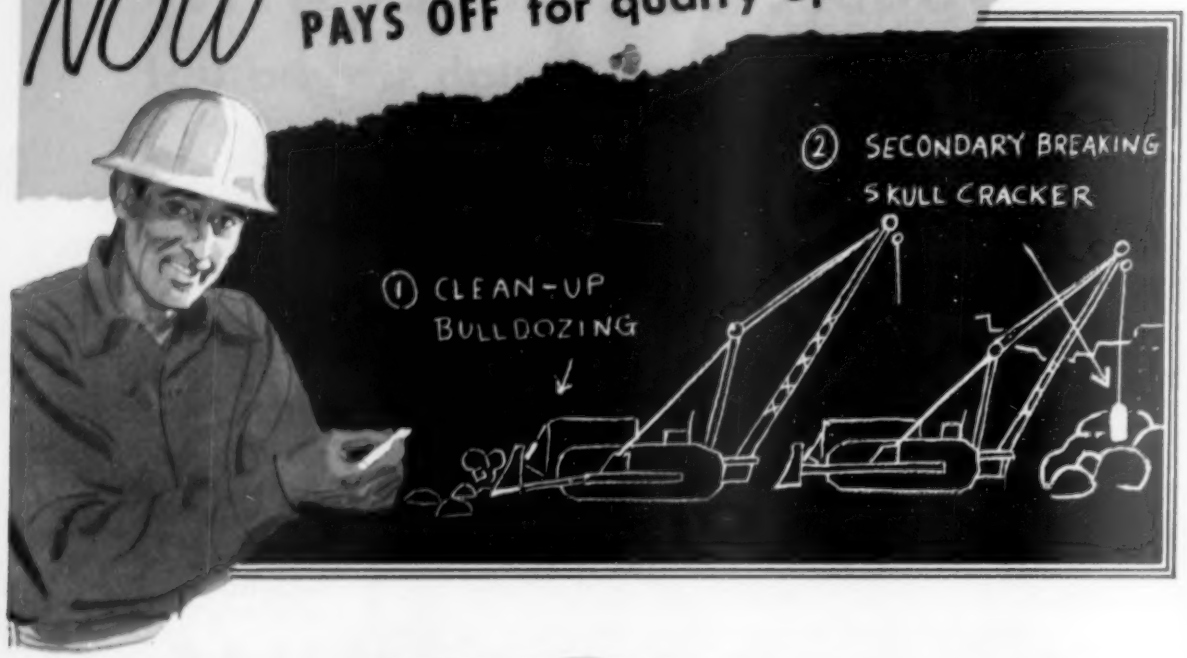
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

Blast produced 17,000 tons of uniformly fractured, well displaced rock—ready for trucks and shovels. Powder factor 3.2 tons per pound of explosives. Face remains straight and clean.

●

Here is how a typical hole was loaded: 900 pounds Atlas Explosives in two decks. ⅓ Giant Gelatin, ⅔ Apex No. 3.

NOW THIS IDEA REALLY PAYS OFF for quarry operators



Use ONE HYSTAWAY® to do the work of 2 machines
... and reduce operating costs!

Hystaway mounted on a new or used Caterpillar® Diesel Tractor combines *bulldozer* and crane (for drop ball in secondary breaking).

WITH THE HYSTAWAY CRANE ONE man and ONE machine can handle all secondary breaking and clean-up work. Many quarry operators have found the Hystaway idea pays off in **reduced operating costs**—because bulldozer and drop-ball operations can be performed by the **same machine.**

MAINTENANCE WORK is also economically performed by this fast-moving bulldozer-crane combination. Lifting screens and motors for crusher repairs and building and maintaining haul roads are but a few of the many **bonus** jobs for the Hystaway.

INVESTIGATE the possibilities of the Hystaway in your operation **now.**

FOR DETAILS, CALL YOUR CATERPILLAR TRACTOR COMPANY DEALER
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Portland, Oregon; Peoria, Illinois; Nijmegen, The Netherlands

PEOPLE

IN THE NEWS

John W. Weber

A.C.P.A. Assistant

JOHN W. WEBER has been appointed an assistant to Howard F. Peckworth, managing director of the American Concrete Pipe Association, Chicago, Ill. He was formerly office engineer in the bridge department of the Chicago, Rock Island and Pacific R.R. Co. Mr. Weber received his B.S. degree in civil engineering at Illinois Institute of Technology, Chicago, Ill. He attended John Carroll University, Cleveland, Ohio; New Mexico School of Mines, Socorro, N.M.; and Blair Academy, Blairstown, N.J.

New Officers of Expanded Shale, Clay and Slate Institute

ALEX R. MCVOY, Texas Industries, Inc., Dallas, Texas, was elected president of the Expanded Shale, Clay and Slate Institute, at the annual meeting of the board of directors. William Thomas, McNear Brick Co., San Francisco, Calif., was elected first vice-president; Otto C. Frei, Georgia Lightweight Aggregates, Inc., Atlanta, Ga., second vice-president; Allan P. Taylor, Kentucky Light Aggregates, Inc., Louisville, Ky., secretary; and Ben Park, Buildex, Inc., Ottawa, Kan., treasurer.

Wallace Wing Named Chairman of Marblehead

WALLACE E. WING has been elected chairman of the board and chief operating officer of Marblehead Lime Co., Chicago, Ill., succeeding Col. Henry Crown. Lester Crown, a vice-president, has been named to succeed Mr. Wing as president of the firm. Mr.

Wallace E. Wing

Lester Crown

Wing became associated with Marblehead Lime Co. after graduation as a chemical engineer from Ohio State University, Columbus, Ohio. He established laboratories at several of the company's plants and became director of research and later director of operations. In 1944 Mr. Wing was elected president. He has served as president of the National Lime Association for four successive terms and is presently a director. He is also active in the American Society for Testing Materials and the American Chemical Society.

Mr. Crown, a graduate of Northwestern University Chemical Engineering School and Harvard Business School, joined the company in 1949 and was elected a vice-president in 1952. He is also a vice-president of Material Service Corp., and a director of the Empire State Building Corp., New York, N.Y.

Officers of Expanded Shale, Clay and Slate Institute. Left to right: Ben Park, treasurer; Allan P. Taylor, secretary; Alex R. McVoy, president; and Otto C. Frei, second vice-president

P.C.A. Representative

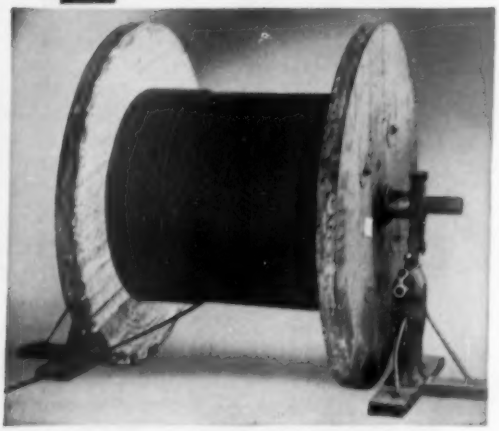
ROSS ADAMS has been appointed public relations representative in the Los Angeles, Calif., district office of the Portland Cement Association, Chicago, Ill. He was formerly a writer in the public relations bureau of the Chicago office of the P.C.A. In his new capacity, Mr. Adams will handle district office advertising and assist in public relations activities of the Association in the Los Angeles district, including southern California, south-

(Continued on page 32)

Tuffy® Tips

Store Rope Like This

Keep spare rope in a dry, sheltered place free of dust, vapors or fume-laden air. If stored out of doors, set reel on blocks off the ground. Clear away weeds and grass and protect with a waterproof covering as shown. Check each month for rust caused by moisture collecting on the rope. Paint with a heavy crankcase or cylinder oil if rust is discovered or even before it shows up if moisture is present.



Unwind Like This

When getting ready to install the rope, special care should be taken to see that the reel is set up for smooth, easy unreeling. Set reel up on jacks as shown above and unreel so the rope pulls off from the bottom of the reel—*not* from the top. Coils should be put on a swift or rolled on the ground to pay off the rope. Kinks or "doglegs" may result from incorrect unreeling, seriously damaging wires of the rope and greatly reducing the ultimate life.

Research Adds Factual Data On Sheave Sizes

Until recently determination of sheave sizes has been by rule of thumb, experience and meager factual data. The influence of variables in operating conditions on rope life must still be determined by experience.

Insofar as bending stresses alone would be the primary cause of rope failure, exhaustive bending tests have established factual data giving a better guide than the former fixed sheave diameter and construction ratio tables.

These tests were conducted under the auspices of the Wire Rope Technical Board and the American Petroleum Institute.

From the experimental data this developed, the following table on sheave diameter factors is introduced as a preliminary guide in selecting the proper sheave size. It lists the general purpose range on the more commonly used rope constructions based primarily upon bending stresses. If it becomes expedient to go either above or below the general range, plotted curves will be supplied by Union Wire Rope engineers for determining the change in service life due to bending fatigue.

SHEAVE DIAMETER FACTORS

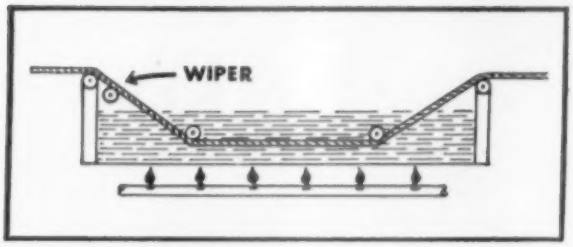
Rope Construction	Higher Range	General Purpose Range D/d Ratios		Lower Range
6x7	For example: Shaft hoists would require higher values	63	42	For example: Truck winch would require lower values
18x7		54	36	
6x17 Seale		49	33	
6x19 Seale		45	30	
6x21 Filler Wire		39	26	
6x25 Filler Wire		36	24	
6x31		33	22	
8x19 Seale		31	21	
6x37		27	18	
8x19 Warrington		27	18	
Tiller Rope		18	12	

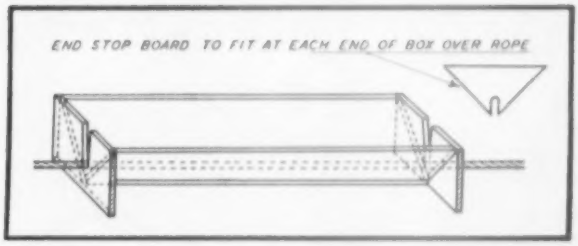
To determine sheave diameter multiply higher or lower range values above by the rope diameter.

Attach By Clipping

The fittings you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power by crimping action are harmful to the rope. Shown here are two rope clamps. One is a combination clamp and thimble. Both provide snug saddling of the rope and grip larger and uncrimped bearing surfaces so tightly that the loads are carried almost solely by the force of friction.

To More Than Break Even In Service Life Give Your WIRE ROPE An Even Break

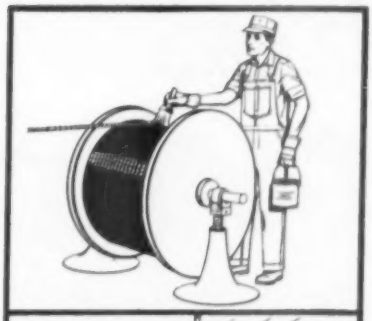


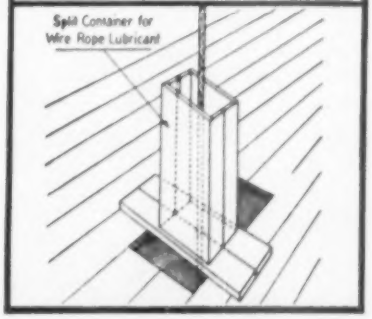


Rope That Is Stored for long periods of time should be lubricated during installation. If it is not possible to lubricate stored rope very often, apply a sealing compound to hold the lubricant that is already present.

Rope In Use can be lubricated most economically without removing it from the equipment on which it is operated. Lubricate rope as often as it needs it—service conditions determine the frequency.

Use Lubricant Hot or Cold, depending on its penetrating qualities. Your local oil company engineer will be able to recommend an oil that will actually penetrate to the working parts of the rope, and not just form a coating that peels off the first time your rope runs through a sheave.





Specifications? – say Tuffy

Tuffy Scraper Rope

Mount a reel on your scraper and move more yardage per foot. Flexible to resist sharp bends, stiff enough to resist looping and kinking.

Tuffy Slings & Hoist Line

A hoist line that gives you extra service life. Slings of 9-part machine braided wire fabric fight kinking — a matched team of balanced performers.

Tuffy Dragline

Rides smooth on drums and hugs the drum when casting. Extra flexible, yet constructed to give maximum abrasive resistance.

Tuffy Dozer Rope

Mounted on special 150′ reel that lets you use rope you now throw away! Increases service life and reduces down-time. 1/2″ and 9/16″.

Your Union Wire Rope Distributor Is Good At Solving

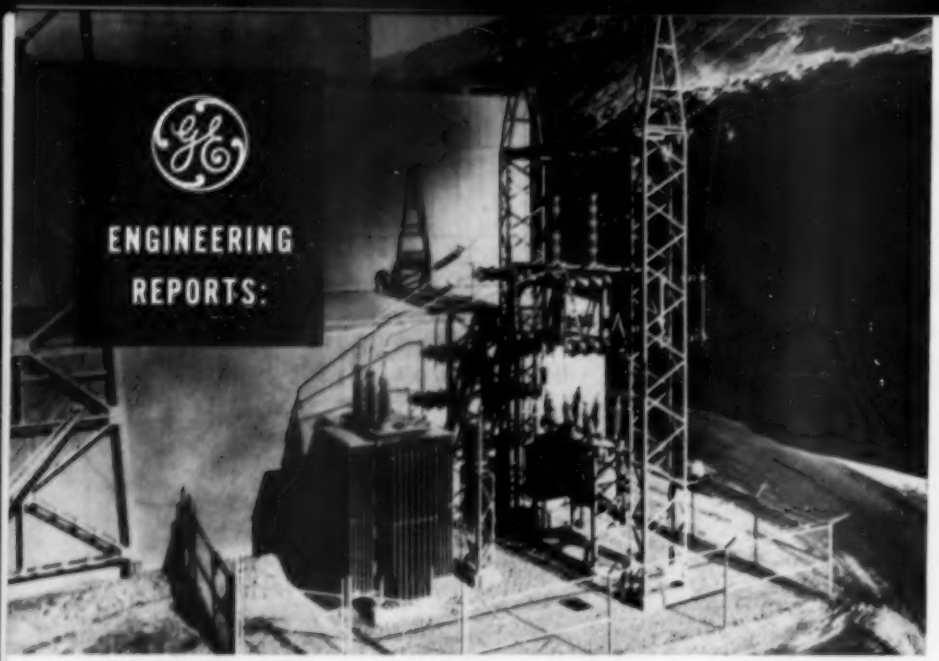
Wire Rope **Riddles.** When you have a wire rope problem, give your Union Wire Rope distributor a call for hurry-up service. Chances are you'll find he has the correct answer at hand—because part of his job is figuring out how your equipment can give you the best operation, at the lowest operating cost! Feel free to call on him anytime.

union *Wire Rope* **corp.**

2156 Manchester Avenue, Kansas City 26, Mo.

3

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand



EASILY EXPANSIBLE G-E outdoor-indoor substation supplies plant power. Lightning arresters, circuit breaker with isolating switches, transformer, and system neutral grounding resistor are outdoors. High-creepage insulators reduce frequency of shutdowns for bushing cleanings.

RELIABILITY of G-E metalclad switchgear (indoor part of main substation) is reviewed by Carl

CENTRALIZED control of raw and finish mill 440-v motors is supplied by G-E Cabinetrol* units. Custom assembled from standard G-E components, they allow easy addition of sections.

*Reg. trade-mark General Electric Co.

"BUILDING BLOCKS" of power for expansion, G-E load-center unit substations can be added as needed to serve new load. Installed close to load, they reduce voltage drop, length of feeders.

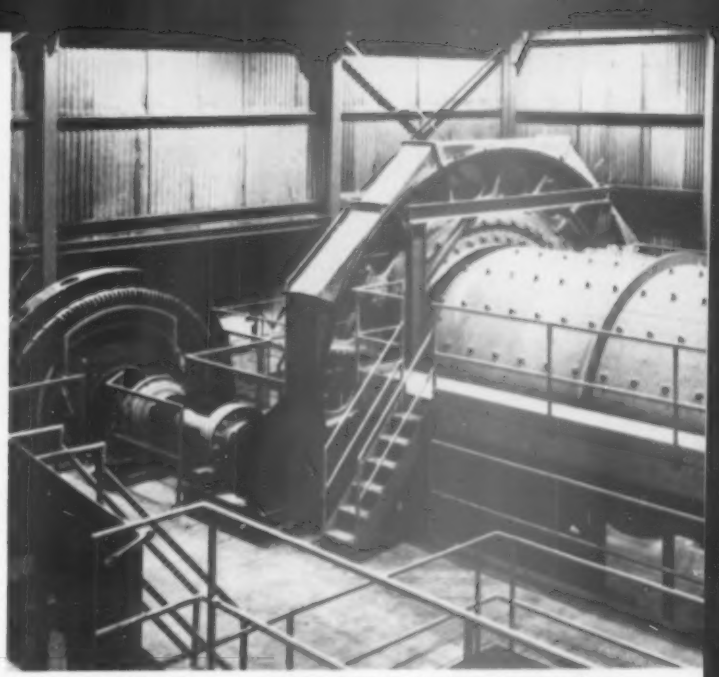
†Trade-mark General Electric Co.

G-E power system will

Planned-in-advance flexibility already paying off at new Sugar Creek facilities

Utilizing latest designs for dry-process plants, Missouri Portland Cement Company's new plant unit at Sugar Creek, Missouri, is now producing over 3000 barrels per day. However, in the face of ever-growing demands for cement by all industry, the company is already proceeding with expansion that will double plant capacity in the near future. This expansion will be smoother, less

Leonard (left), plant electrical foreman, and G-E sales engineer Harry Moak. Limitamp† starters (right) provide precision control of high-voltage motors, allow mill spotting.



RUGGED SERVICE is performed by 1250-hp, high-torque, synchronous motor driving 9½′ x 32′ finish mill. Motor was designed for across-the-line starting and to allow spotting of mill manholes.

help ease expansion at new Missouri Portland plant

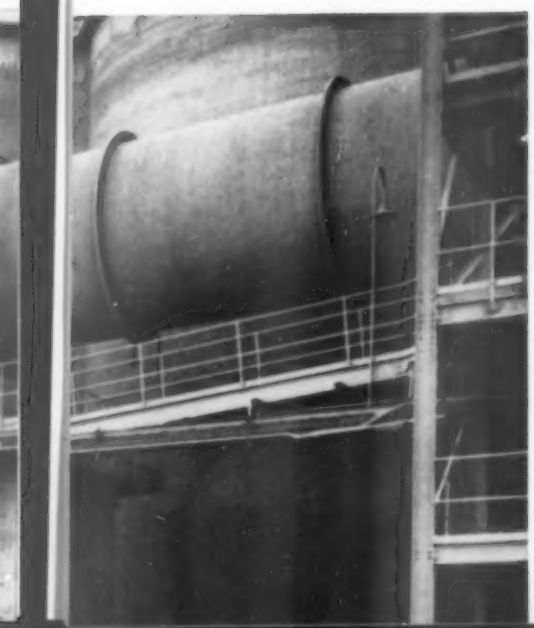
expensive, and more simply accomplished because, with the help of G-E engineers and equipment, plant designers planned ahead to assure easy expansibility through use of modern power system design.

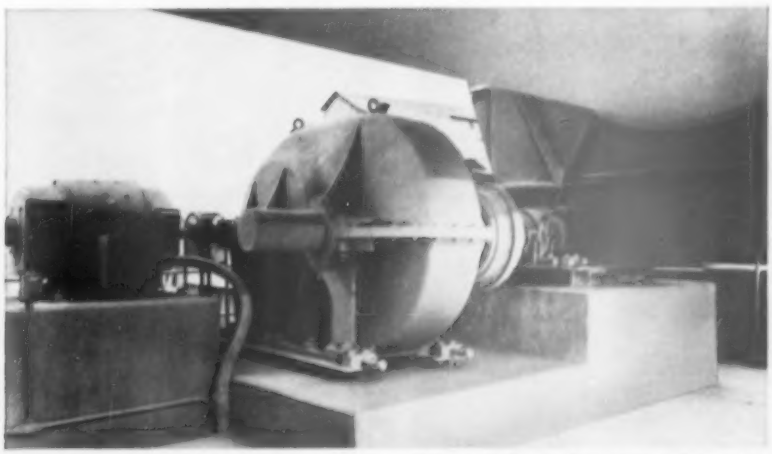
Working closely with Missouri Portland's engineers and consultants, General Electric cement industry application engineers helped develop this flexibility in an electrical system integrated with plant processes to facilitate smooth-flowing, reliable operation. Processing, as well as most materials-handling operations, is nearly 100-percent powered and controlled by G-E equipment.

Early in your electrical planning for a new or expanding cement plant, use G-E engineering aid to assure an electrical system designed for maximum output today and flexibility for expansion tomorrow. For further information contact your G-E Apparatus Sales Office or write for Bulletin GEA-5984 to General Electric Co., Section 658-16, Schenectady, N. Y.

Engineered Electrical Systems for the Rock Products Industry

GENERAL ELECTRIC





UNIFORM, CONTROLLABLE kiln speed provided by G-E adjustable-voltage, d-c motor (above) with speed reducer improves quality of cement through better process control. The 11¼′ x 350′ kiln is shown at left. General Electric motor-generator set and kiln-drive controller are installed beneath motor, inside kiln pier at far left.

eastern Nevada and Arizona. Prior to joining the Portland Cement Association, Mr. Adams was a public information officer in the U.S. Army at Fort Leonard Wood, Mo. He formerly was director of public relations at Arkansas Polytechnical College, Russellville, Ark., and has worked for the Associated Press and United Press. He holds B.S. and M.S. degrees in journalism from the University of Missouri, Columbia, Mo.

Marquette Appointments

CHARLES E. WUERPEL, technical director, Marquette Cement Manufacturing Co., Chicago, Ill., and Lawrence H. Vroman, manager of engineering and construction, have been elected vice-presidents of the company. D.S. Colburn, executive vice-president, has retired but was re-elected vice-president with the status of consultant. Mr. Wuerpel joined Marquette in 1948 as head of the technical department after serving a number of years with the U.S. Corps of Engineers. Mr. Vroman is a veteran of 30 years with the company. He was appointed administrative chief of the engineering and construction departments in 1955.

Charles E. Wuerpel

Lawrence H. Vroman

Michigan Limestone Officers

JOSEPH A. VALENTIN has been appointed vice-president and manager of sales of the Michigan Limestone Division, United States Steel Corp., Detroit, Mich. He was formerly manager of the northern district and manager of sales for the division. Carl G. Hogberg, who was formerly assistant to the vice-president, has been named assistant vice-president, and Donald L. Weeda, assistant treasurer, has been made treasurer.

Mr. Valentin, a native of Hammond, Mich., attended Ferris Institute, Big Rapids, Mich., where he received a degree in pharmacy and chemistry. He joined U.S. Steel in 1918 and was assigned to the transportation department of Michigan Limestone and Chemical Co., Rogers City, Mich. He subsequently became chief chemist and director of industrial relations. When Michigan Limestone was consolidated with Pittsburgh Limestone Corp. in 1951, Mr. Valentin was appointed manager of the Calcite plant. Two years later, he was named manager of the northern district and then manager of sales.

Carl G. Hogberg

Mr. Hogberg was born in Escanaba, Mich., and graduated from Michigan College of Mining and Technology, Houghton, Mich. He became associated with U.S. Steel in 1935 as a blast furnace apprentice at South Chicago Works. Prior to his appointment as assistant to vice-president, he was associated with the company's activities dealing with the technical aspects of blast furnace and raw material development and usage.

Joseph A. Valentin

Mr. Weeda is a native of Clearfield, Iowa, graduated from Northwest Missouri State College, Maryville Mo., and received an M.B.A. degree from Ohio State University. He joined U.S. Steel as a credit trainee with American Steel and Wire Division in Chicago. In 1951, he was transferred to Michigan Limestone Division as assistant treasurer.

Donald L. Weeda

National Gypsum Appointments

LEONARD L. HANK, formerly general production manager, has been elected vice-president of manufacturing in charge of all plants, mines and quarries of National Gypsum Co., Buffalo, N.Y. He was formerly general production manager of the gypsum plants and will be succeeded by Lewis B.

(Continued on page 35)

New bucket elevator components by CHAIN Belt match today's heavier cement mill demands

Best chains ever designed for elevator service!

To meet the demands of greater capacity and longer operating hours of modern cement mill bucket elevators, CHAIN Belt Research developed new and improved chains of greater strength and durability, especially for cement mill service.

BALANCED DESIGN . . . All chain parts balanced for utmost strength, lightest weight. Less dead weight, less bulk . . . take less horsepower to move than other chains for this service.

MAXIMUM WEAR-LIFE . . . High quality steels, proper heat-treatment, controlled press fits, plus fine workmanship assure maximum wear-life.

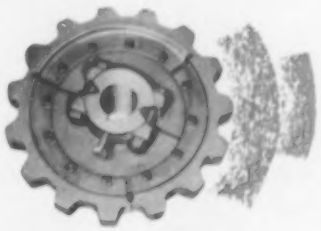
ACCURATE PITCH . . . Close tolerances and controlled fits maintain accurate pitch for long, top performance. Wide links and generous attachment length provide extra support for modern, big-capacity buckets.

Used on any installation, you can expect more for your chain dollar — more service, capacity, efficient operation when you choose new Rex Elevator Chains!

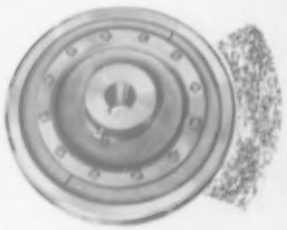
Bucket Elevator Chains

Segmental rim sprockets, traction wheels cut down time

The tough, long-lasting hardened cast steel rims on these sprockets and traction wheels simply bolt on. When replacement is necessary, only the rim is replaced. Down time is cut to hours, not days. Sprocket rims are machined on two sides — may be reversed to give double life. Hubs are available in split or solid design.



Segmental Rim Sprockets



Segmental Rim Traction Wheels

New bucket design gives large capacity, long service

Designed especially for the new stronger chains, these buckets have many new design features. The style AC, for instance, features a hooded back that gives efficient discharge on continuously spaced installations. It also has a high front that increases its capacity for handling free-flowing materials. Another feature is the special air vents in the bottom that prevent trapping during loading and unloading of fluffy materials.

These buckets will give longer service under rough cement mill treatment. Tough Rex High-Grade Malleable Iron is used. Extra thick bucket walls are provided for greater strength, longer wear. Buckets are designed to give you more efficient, increased-capacity handling of all materials.

Rex Style AC Bucket

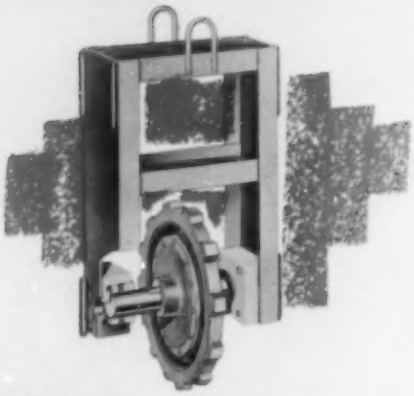
Rex Style AA Bucket

TURN THIS PAGE FOR MORE INFORMATION

CHAIN BELT COMPANY

LEADERSHIP . . . through creative engineering

CHAIN Belt gives you a full line of products for economical cement mill service



Internal gravity take-up

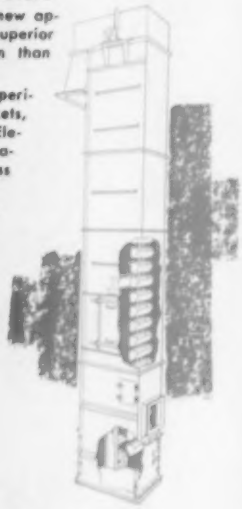
Another Rex development, this gravity take-up automatically compensates for chain and sprocket wear and temperature variations . . . lengthens life of chains, sprockets and bearings. The welded steel frame floats freely in an upright guide inside the elevator casing. Internal mounting insures a dust-tight boot section. Bearings are heavy-duty, heat-treated tool steel sleeves for long, trouble-free service.

For modern cement mill service — REX RATED Centrifugal Discharge Bucket Elevators

The ultimate in bucket elevator design! A completely new approach to elevator design makes the REX RATED Elevator superior for economical, dependable, greater capacity operation than ever before.

Rex Engineers combined modern elevator design and field experience with new components — bearings, chains, buckets, sprockets, take-ups — to bring you the first "Balanced Design" Bucket Elevator. These elevators are matched to modern cement mill operations — they have greater capacity, will work longer with less maintenance, give you more service at lower costs.

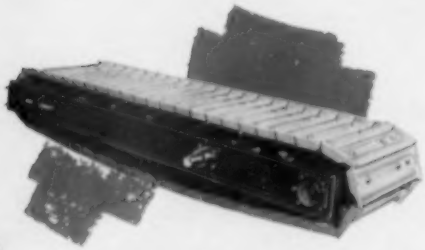
REX RATED Centrifugal Elevators take little space — save valuable floor area. They are economical to construct. And because they are balance designed, they make down time and production lags a thing of the past.

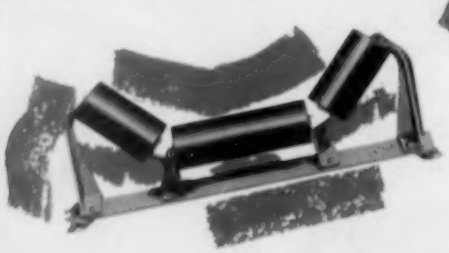


Shafer Self-Aligning Roller Bearings

The unique Shafer Bearing combines the best of roller and ball design. The result is a tough, high load-carrying bearing that provides a high degree of self-alignment. To this feature is added a built-in Micro-Lock that provides easy adjustment for simple installation and maintenance.

Another feature of these bearings is a special "Z" Housing Seal that keeps lubricant in and dirt out. All the features of the Shafer Bearing combine to give more economy, longer service, more efficient operation on any cement mill job.





Look to CHAIN Belt, too, for feeders, belt idlers

CHAIN Belt offers a complete line of other bucket elevators, components and bulk materials handling equipment. Here, for example, are Rex Apron Feeders and Rex Belt Idlers.

For perfect production control, Rex Apron Feeders give you a uniform, metered feed rate. No underfeeding; no overfeeding. You can count on regulated flow at all times. And these feeders are made to handle a wide capacity range at top efficiency . . . take hot or cold material.

Rex Idlers like the bucket elevators are REX RATED to match the job. They are famous for their long, dependable operation and easy servicing features. Rex Idlers are quality made with labyrinth seals . . . roller bearings . . . unit inner-tube mounting — all to assure low power consumption, long life and smooth rolling.

CHAIN Belt Company
4649 W. Greenfield Ave., Dept. RP-2
Milwaukee 1, Wisconsin

- ☐ Send informative catalog on REX RATED Centrifugal Discharge Bucket Elevators.
- ☐ Send informative literature on Rex Bucket Elevator Components.
- ☐ Please have a CHAIN Belt District Sales Engineer call.

Name .....

Address .....

Company .....

City ..... Zone ..... State .....

CHAIN BELT COMPANY
MILWAUKEE 1, WISCONSIN

Leonard L. Hank

Crowell, who will be replaced by Robert E. Scifres, manager of the Shoals, Ind., plant. Mardis B. Turner, formerly production superintendent, has been named to succeed Mr. Scifres at the Shoals plant.

Mr. Hank was born in Cincinnati, Ohio, and studied engineering and business administration at the University of Cincinnati. He joined the company in 1946 as manager of the Kalamazoo, Mich., paper plant, and in 1951 was promoted to production manager in charge of all paper plants.

Mr. Crowell, a native of Utica, N. Y., graduated from Rensselaer Polytechnic Institute, Troy, N.Y. He joined National Gypsum in 1953 as an assistant production manager.

Mr. Scifres was born in Lafayette, Ind., and was graduated from Purdue University with a degree in electrical engineering and later received an M.S. degree in business administration from Massachusetts Institute of Technology, Cambridge, Mass. He joined the company in 1942 as electric shop foreman

Lewis B. Crowell

of the Bluebonnet, Texas, Ordnance plant. After serving at the Mobile, Ala., and New York City plants, he was named assistant production manager in 1952 and subsequently became production manager.

Mr. Turner is a native of Lovington, Ill., and joined National Gypsum Co. in 1953 as plant engineer at National City, Mich. He was subsequently promoted to production superintendent.

Technical Service Director

RODNEY G. BUERGIN has been named director of technical service in the research division of National Gypsum Co., Buffalo, N.Y. A native of Madison, Wis., Mr. Buergin graduated from the University of Wisconsin with a B.S. degree in light building industry. He joined the company in 1950 as a research engineer, later became research supervisor and then research group leader. For the past two years he has been assistant director of development research. Mr. Buergin is a member of the Gypsum Association and the American Society for Testing Materials.

OBITUARIES

Stuart Duncan

STUART DUNCAN, chairman of the board, Marquette Cement Manufacturing Co., Chicago, Ill., died May 24. He was 72 years of age. Mr. Duncan was the son of Nicholas W. Duncan, one of the founders of the company, and began his career with the firm in 1906 as assistant treasurer. He became a director in 1915 and chairman of the board in 1933. A graduate of Niagara University, Niagara Falls, N.Y., Mr. Duncan was a life-time resident of LaSalle, Ill. His son, Paul Duncan, is serving as assistant secretary and assistant treasurer of Marquette Cement Manufacturing Co.

SAMUEL C. HADDEN, formerly executive secretary of Indiana Mineral Aggregates Association, Inc., passed away May 9 at his home in Indianapolis, Ind. He was 74 years old. A graduate civil engineer of the University of Illinois, Urbana, Ill., Mr. Hadden served on the faculty of Michigan Agricultural College for several years. In 1911 he became associate editor of *Engineering and Contracting*, a civil engineering publication. Later he was elected executive secretary and engineering director of the Indiana Sand and Gravel Association, predecessor of Indiana Mineral Aggregates Association, from which he resigned to serve as chairman of the Indiana State Highway Commission from 1941 to 1945. For the next four years he served as consulting highway engineer for the Automobile Club of Michigan and the Chicago Motor Club. In 1949 he was again appointed chairman of the State Highway Commission, serving until 1953. Soon thereafter he became ill and since then had been in semi-retirement. Mr. Hadden was at one time president of the American Association of State Highway Officials. In 1952 he received the George S. Bartlett Award for his "outstanding contribution to highway progress."

MACY W. SMITH, works manager of the Guelph, Ontario, Canada, plant of Canadian Gypsum Co. Ltd., subsidiary of United States Gypsum Co., Chicago, Ill., died suddenly on June 2. He was 43 years old. Born in Clinton, Mo., Mr. Smith was appointed mill superintendent at the Genoa, Ohio, plant in 1937. He was transferred to Caanan, Conn., in 1950 and then to Evans, Wash., before becoming works manager at the Guelph plant.

JAMES B. BERGS, founder and president of the Pioneer Silica Products Co., St. Louis, Mo., died April 28 at the age of 62. A graduate of Yale University, New Haven, Conn., Mr. Bergs founded the firm more than 25 years ago.

CLAUDE C. BLAIR, retired president of Metropolitan Brick, Inc., Canton, Ohio, which was consolidated with Bessemer Limestone and Cement Co., Youngstown, Ohio, in 1917, passed away April 22. He was 82 years old.

PERCY TOOLEY, owner of the Dickinson Concrete Products Co., Dickinson, N.D., died May 2 in an automobile accident near Mandan, N.D. He was 40 years old.

DELMAR P. MCARTOR, assistant secretary and treasurer of the Universal Concrete Pipe Co., Columbus, Ohio, died May 12. He was 59 years of age.

YOUR ENGINES: How to Get More Power with Less Fuel

★ **MORE POWER**—because *Texaco Ursa Oils* are especially refined and processed to prevent the formation of harmful, power-stealing deposits.

★ **LESS FUEL CONSUMPTION** – because detergent and dispersive *Texaco Ursa Oils* keep piston rings free for proper compression and full combustion. This eliminates blow-by and assures full power with less fuel.

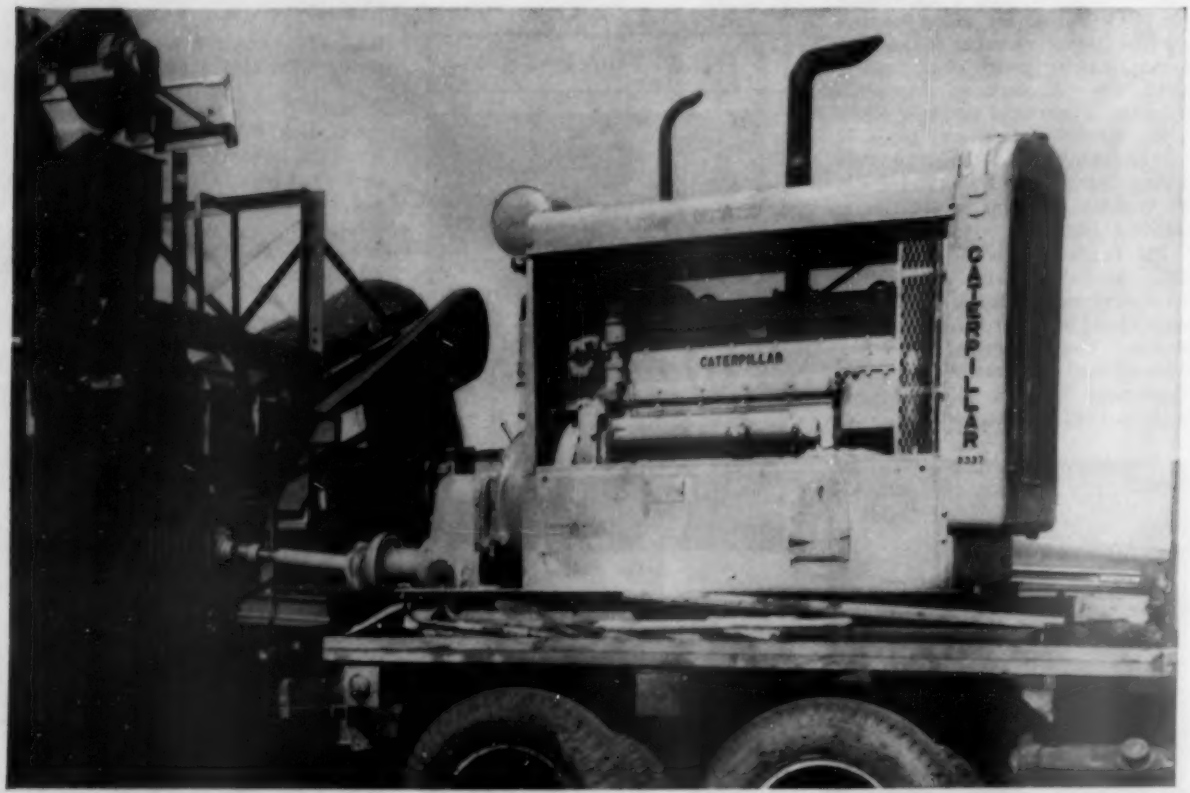
★ **LOWER MAINTENANCE COSTS** – because *Texaco Ursa Oils* have superior lubricating ability and so minimize wear. Parts last longer, periods between scheduled overhauls can be safely extended.

There is a complete line of *Texaco Ursa Oils* to meet the requirements of all diesel and heavy duty gasoline engines. All are especially designed to assure *more power* with *less fuel* over *longer periods* between overhauls.

For your air compressors, use *Texaco Regal Oil R&O*. It assures clean dependable performance. For wire rope and open gears, use *Texaco Crater* or (for added application convenience) *Texaco Crater X Fluid*. You'll keep rope strong longer, get longer gear life.

A Texaco Lubrication Engineer will gladly help you get greater efficiency and economy from all your equipment. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

INDUSTRY NEWS

Cover Picture

THIS MONTH'S COVER ILLUSTRATION shows the new 750 t.p.h. sand and gravel plant of Consumers Co. at Crystal Lake, Ill. The plant features live storage capacity of 4000 cu. yd. over a reclaiming tunnel belt conveyor system, an unusual pit conveyor system which can be easily moved to reach any area desired, and facilities to meet any specification requirement. The main screening plant, shown in the illustration, has two primary and four secondary vibrating screens for the preparation of six major aggregate sizes plus sand.

To Build Asbestos Plant

LAKE ASBESTOS OF QUEBEC, LTD., a subsidiary of American Smelting and Refining Co., New York, N. Y., has announced plans to build an asbestos plant, with a daily capacity of 5000 tons, in the Black Lake-Thetford Mines district, 75 miles south of Quebec City. Asbestos ore will be taken from ore bodies which lie 70 to 200 ft. beneath the waters of Black Lake. When the overlying water and solids have been dredged from the Black Lake site, the asbestos ore will be mined by the open-pit method. Total cost of development is expected to exceed $32,000,000.

Company Formed to Acquire and Operate Gypsum Plants

BESTWALL GYPSUM CO. has been organized at Ardmore, Penn., to acquire and operate eight gypsum and paper products plants, formerly owned and operated by Certain-teed Products Corp., in the United States and Canada. Subject to the approval of a special stockholders meeting, each Certain-teed holder will get one Bestwall share for every three Certain-teed shares held. Bestwall's assets will be over $20,000,000, and it will own gypsum plants at Fort Dodge, Iowa, Grand Rapids, Mich., Blue Rapids, Kan., Acme, Texas, Akron, N. Y., and Sigurd, Utah. In addition, the new company will own a paper mill at Pryor, Okla., and a fiberboard, boxboard and newsprint plant at Thorold, Ont., Canada. The company will develop gypsum deposits located in Nova Scotia and owned by Bestwall Gypsum Co., Ltd., and also plans to build three gypsum board plants and a paper mill on the Atlantic coast of the United States, at a cost of about $32,000,000.

Bureau of Mines Reports

BUREAU OF MINES, Department of the Interior, Washington, D.C. has found raw materials from Alaska, Florida, Texas and Virginia suitable for making mineral-wool insulation and similar products.

In addition to presenting test results, the Report of Investigations 5203, "Laboratory Results of Testing Mineral-Wool Raw Materials", describes present methods of making mineral wool.

Another Bureau of Mines report, describing in detail all phases of activity in the limestone industry, from prospecting, development and quarrying, to processing and utilization, also has been issued. To order the report, identify it as I.C. 7738, "Limestone and Dolomite".

PCA To Build Research Labs

PORTLAND CEMENT ASSOCIATION, Chicago, Ill., will build two research buildings at Skokie, Ill., according to an announcement by G. D. Kennedy, president.

Dr. A. Allan Bates, vice-president for Research and Development, dedescribed the buildings. The Structural Development Laboratory will be "one giant testing machine" where test equipment will be constructed as required from large elements of structural steel shapes and hydraulic jacks.

The Fire Research Center ultimately will contain six furnaces large enough to handle tests on full-scale beams, columns, walls and floor slabs. The first major research project will be the fire resistance of prestressed concrete, since more information is needed for current applications.

Mr. Kennedy stated that with these additions to present facilities the association will have by far the largest and best equipped cement and concrete research and development laboratories in the world.

Expanded Clay and Shale Association Meeting

THE EXPANDED CLAY AND SHALE ASSOCIATION held its mid-year meeting at Syracuse, N. Y., on June 18 and 19. The two-day conference began with a meeting of the board of directors, and a dinner meeting in the evening at the Syracuse Hotel, with Harold Anson, Winkrete Co., Syracuse, and George B. Southworth, The Master Builders Co., Cleveland, Ohio, as guest speakers. A tour of the Onondaga Brick Corp. plant was held June 19, as well as the final business meeting which included a talk by Sol Marenberg, consulting engineer, Garfinkel and Marenberg, New York, N. Y. A special program for the ladies included visits to the Onondaga, N. Y., plants of Syracuse china and Iroquois china.

Safety Award

NORTH AMERICAN CEMENT CORP., New York, N. Y., recently celebrated the completion of one year without a lost time accident at its Alsen, N. Y., cement plant. Approximately 175 employes were honored at a plant safety rally, at which a pair of safety shoes were presented to each employe. Speakers included Perry W. Andreas, executive vice-president of the corporation and Paul M. Hedley, former superintendent of the local plant, now director of industrial relations and safety director, who emphasized the importance of proper use of safety equipment.

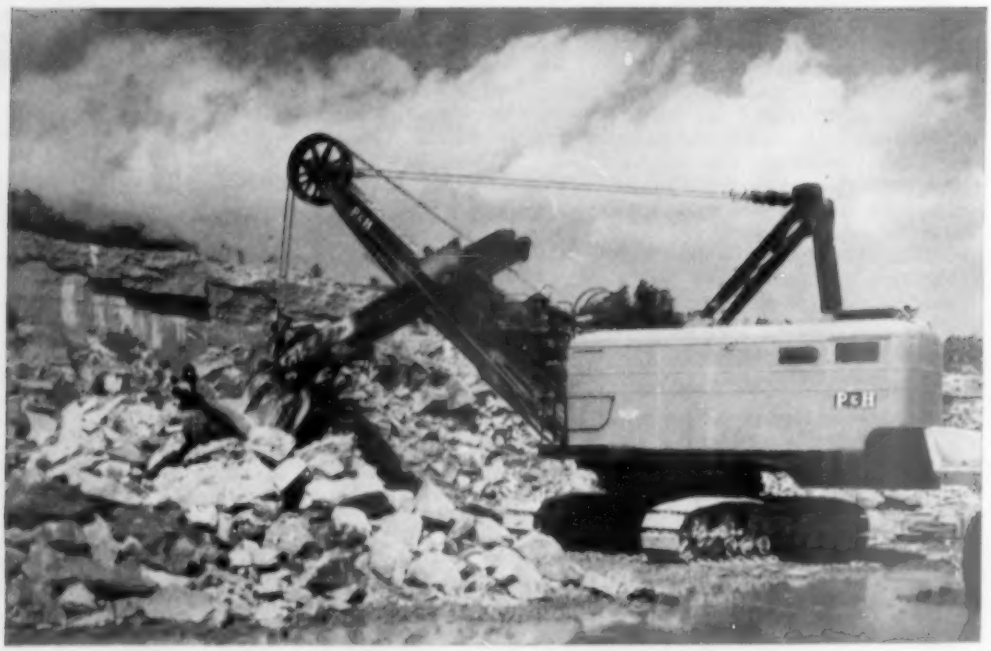
Purchases Cement Plant Site

UNIVERSAL ATLAS CEMENT CO., a subsidiary of U. S. Steel Corp., New York, N. Y., has purchased a 34 acre tract of land from the Baltimore & Ohio Railroad Co., for location of its proposed cement plant at Lorain, Ohio. The site is situated along the southwest shore of the Black River between the river and the B & O right-of-way, and has an approximate 2400-ft. frontage on the river. The purchase is contingent upon approval by the Lorain City Council of certain changes in the city ordinances, which the cement company considers necessary. Among the requirements which the firm is asking the City Council to consider are: the establishment of a new dock line

(Continued on page 41)

Which electric leads the

Magnetorque* and Electronic Controls



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to meet your specific needs

Allis-Chalmers Type H Starters may be equipped with either air-break or oil-immersed contactors —installed in the same sized space.

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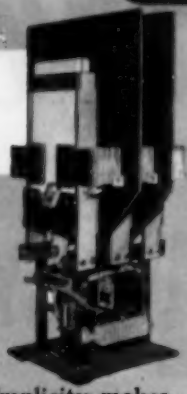
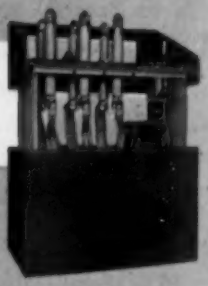
FOR 2300 TO 5000 VOLT MOTORS



AIR

Designed for top performance on the rough-tough jobs. Advantage of contacts operating in air include long contact life, reduced fire hazard, easy maintenance. Double-break contacts, vertical action and dual blowouts provide long, dependable operation. Design simplicity makes contactor particularly adaptable for applications requiring frequent starting, inching, reversing, or dynamic braking.



OIL

Meets operating demands of semi-hazardous locations. Contactor operates under oil to prevent sparks from igniting atmosphere and to protect mechanism from corrosion. Contactor is time-proved clapper type. Self-cleaning, rolling-wiping action extends contact life. Self-aligning E-type magnet provides perfect armature seating . . . quiet, maintenance-free operation.

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ALLIS-CHALMERS A-4976

at the turning basin in the Black River; changes in the city zoning ordinance to permit building and operation of a cement plant on the desired site; approval of the company plans with respect to access roads; consent to connections to city sewage and water systems; and approval of a contemplated pumping station by which service water for the plant would be drawn from the river.

Propose Potash Mine

DELHI-TAYLOR OIL CORP., Dallas, Texas, has made statements to the press anticipating a $20 million potash mining and beneficiation program at their properties nine miles west of Moab, Utah.

No formal public announcement of the start of a plant and mine has been made, but Dr. Elton Soltes, project manager, gave his opinion that sinking of a 3000 ft, circular, concrete-lined shaft would begin this year at the 19,000 acre property located in the Seven Mile Anticline Area.

Dr. Soltes said, "We have demonstrated that we have a correlatable and continuous bed of potash which extends past the limits of the projected area . . . . However, a portion of the original area included in our former estimate has now been demonstrated to contain high grade carnallite (potassium and magnesium chloride) rather than sylvite."

Water rights have been obtained on the Colorado River and Delhi-Taylor has a right-of-way from the river to the property. A 25 mile railway spur will be built from the main line of the Denver and Rio Grande Railroad.

Dr. Soltes continued, "Under our present plans we expect to be in operation with the beginning of revenue within two and one-half to three years."

Vermiculite Fire Rating

A FOUR-HOUR FIRE RATING has been issued to steel columns protected with 2-in. of machine-applied vermiculite portland cement plaster, as the result of a fire test sponsored by Vermiculite Institute of Chicago. The end point was reached at 4 hr., 34 min. The protection is adaptable for interior columns where more than ordinary wear and tear is expected.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 19,578,000 bbl. of finished cement during February, 1956, as reported by the Bureau of Mines. This was an increase of 11 percent over February, 1955. Mill shipments totaled 15,929,000 bbl., an increase of 15 percent, compared with February, 1955, while stocks on hand were 28,939,000 bbl., 7 percent more than on the same date a year ago. Clinker production during February, 1956, amounted to 23,131,000 bbl., an increase of 11 percent from the February, 1955, figure. The output of finished cement came from 157 plants in 37 states and Puerto Rico. During the same period of 1955, 17,611,000 bbl. of finished cement were produced.

Demonstration of skid-shovel before group of trade magazine editors at International Harvester's Dundee, Ill., proving ground

Florida Cement Consumption

FLORIDA'S CONSTRUCTION INDUSTRY consumed almost 9,000,000 bbl. of United States produced cement during 1955, according to the Florida State Chamber of Commerce. This was an increase of 8 percent over 1954, and 20 percent above 1953. National gains were 7 percent and 13 percent respectively, according to the chamber.

Builds Cement Plant

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, has announced plans to build a 2½ million bbl. a year capacity cement plant at Wampum, Penn., at an estimated cost of about $12,000,000. Two kilns, 400 x 12 ft. in diameter are being installed at the new plant. The company already operates a plant at the same location near New Castle, Penn., and additional limestone deposits have been acquired to assure a raw material reserve for 40 to 50 years, according to Ellery Sedgwick, Jr., president of the company. The new facilities are scheduled for completion in the third quarter of 1957, and will serve Western Pennsylvania, Northeastern Ohio, and the northern part of West Virginia.

Import German Cement

WOODWARD AND DICKERSON, INC., Philadelphia, Penn., arranged for the delivery of a 35,000 bag shipment of West German cement to Kolinski Concrete Co. of South Milwaukee. The cement is needed because of area shortages.

Construction Equipment Demonstration

INTERNATIONAL HARVESTER CO., Chicago, Ill., unveiled several new lines of construction equipment at its Dundee, Ill., proving ground on May 15 before a large group of construction and mining magazine editors. The demonstration climaxed a two-day press party designed to show International's growth since 1950. Tours were also made to the company's Tractor Works and Melrose Park Works to observe manufacturing of bulldozers and tractors.

Highlighted at the demonstrations were the new high-speed rear-engine crawler-mounted Model 12 Payloader and the new International 18- and 24-ton Payhaulers—off-highway, rear-dump trucks. Addition of these units to the company's existing line of crawler tractors, power units, scrapers, bottom-dump wagons, skid-shovels, and front-end loaders gives International a complete line of construction equipment.

Also featured during the showing were the new Models 75 and 55 Payscrapers, the International-Drott TD-6 Four-in-One Skid-Shovel, several crawler tractors, including the TD-24 torque-converter unit, six Hough rubber-tired front-end loaders, various power units, and two new V-line motor trucks. Detailed description of the new equipment can be found in the New Machinery section of this issue.

Tour Cement Plant

CALAVERAS CEMENT CO.'s plant at San Andreas, Calif., was recently visited by 650 members of the Pacific Coast Chapter of the Railway and Locomotive Historical Society, in commemoration of the 75th year of the Mother Lode, San Joaquin and Sierra Nevada Narrow Gauge Railroad. The Calaveras cement plant is situated at Kentucky House, once a trading post

(Continued on page 45)

Breaks out rock, palletizes and loads it out . . .

Versatility of Michigan Tractor Shovel cuts handling costs for Pacific Stone Co. quarry

When you can buy one machine to handle a *multitude* of quarry jobs, you've got a real winner. That's exactly the experience of Pacific Stone Company's dimension stone quarry near Winnemucca, Nevada—with their 1⅜-yd. capacity Michigan Tractor Shovel. They use the Michigan to strip overburden, clean up, dig trenches for placing the saws, handle rock and load it out. Pacific Stone had tried several other pieces of equipment on these different jobs, but only the Michigan proved satisfactory as an *all-around machine.*

Breaks out large pieces

After a horizontal and vertical cut has been sawed into the face of the rock, the Michigan operator inserts the bucket cutting-edge into the cut, works the cutting-edge up and down to break out the rock. The Michigan, with two big double-acting bucket cylinders, exerts tremendous break-out force at any height, independent of the boom hoist. When the rock is loose, the operator loads it into the bucket.

Palletizes and loads

The Michigan carries the large pieces of rock across the pit and places them on pallets (see photos). With a special chain attachment which hooks onto the bucket, the Michigan picks up the loaded pallets and lifts them aboard standard flat-bed semi-trailers for the 150 mile trip to Winnemucca. Each pallet-load weighs approximately 11,000 lbs., yet

the Michigan handles them with ease.

Make your own comparison

When Sierra Machine Co. (the local Michigan distributor) first demonstrated the Model 125A to Pacific Stone Co., the Michigan's heavy-duty versatility was obvious. The exclusive Clark power-train—3-to-1 torque converter, power-shift transmission and planetary-wheel axles—gives this machine more useable power and speed than you've ever seen on a rubber-tired Tractor Shovel. Clark gives you a completely integrated product—one single source for design, manufacture and service of all basic components of the Michigan Tractor Shovel.

How to buy a Tractor Shovel

Before you buy a Tractor Shovel, make your own comparison. Check the specifications on paper—tire size for adequate flotation, power, speed, etc. Then find out *in person* what a Michigan will actually do on the job. Ask your Michigan distributor to show you how this machine digs its way into tough material for heaping bucket loads, power-shifts through fast loading cycles, covers more ground in your pit at speeds up to 27 mph. Check it out on jobs you've always considered too tough for rubber-tired Tractor Shovels—on many, it will outproduce crawler-loaders!

There's a Michigan Tractor Shovel to meet your loading requirements—1-yd., 1⅝-yd. and 2¼-yd. capacity. On every model in the Michigan line, you get the exclusive Clark power-train as standard equipment—torque converter, power-shift transmission and planetary-wheel drive axles.

The Michigan Tractor Shovel invites your comparison—name the job you want to see it on.

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2481 Pipestone Road
Benton Harbor 27, Michigan

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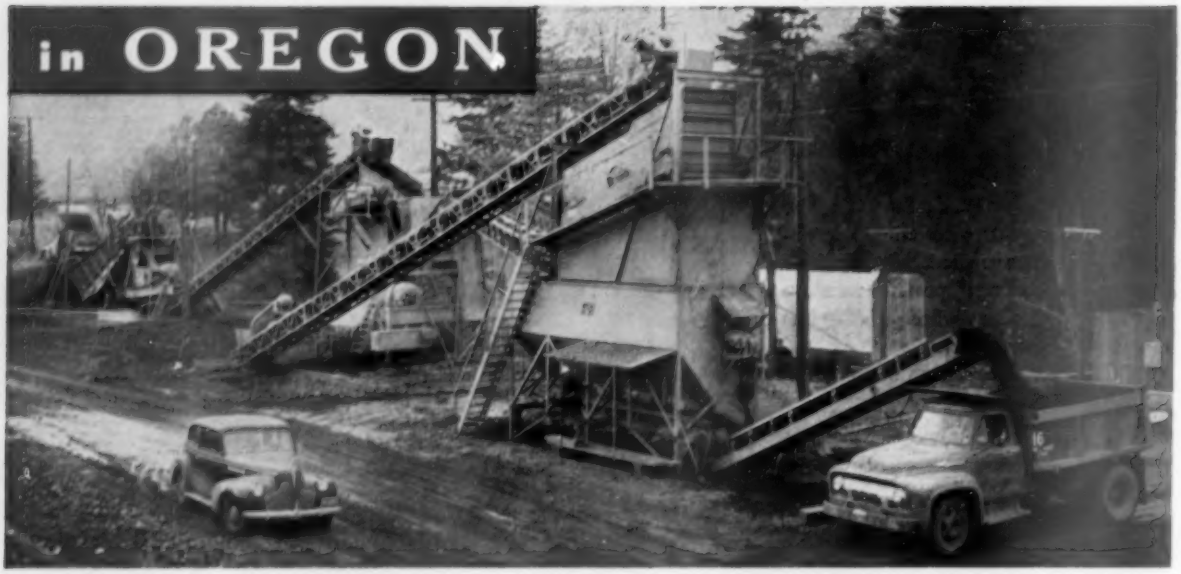
CLARK® EQUIPMENT

1 **To break out** a large chunk of rock, the Michigan operator inserts the bucket blade into the horizontal cut—then works the blade up and down. When the rock is loose, the operator crowds in to get the rock into the bucket.

2 **Low-level bucket action** enables the operator to carry the big chunk low, after it has been broken out. Operator visibility is good, center of gravity is low for fast travel across the pit where the rock is placed on pallets for shipping.

3 **Handling 11,000 lb. pallet-load** of rock with a special chain rig. The Michigan still has plenty of lifting height to put the load aboard a standard semi-trailer.



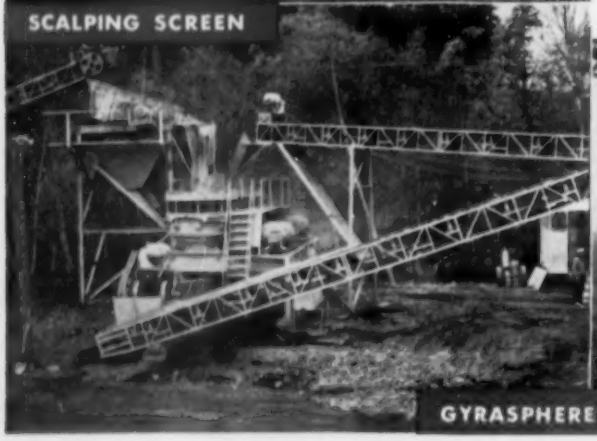
Roy L. Houck & Sons Plant at Salem, Oregon, uses

TELSMITH
EQUIPMENT

Crushing basalt rock, this all electric driven plant makes a minus 2½-inch finished product, 25% of which is minus ¼-inch. Average production is 170 yards per hour.

TELSMITH EQUIPMENT IN THIS PLANT— 42" x 33' Portable Apron Feeder • 4' x 10' 2-deck Heavy-Duty Scalper • 489-S Gyrasphere Crusher • 48 Fine Crushing Gyrasphere Crusher.

Q-34 **Send for Telsmith Equipment Guide 266**



SMITH ENGINEERING WORKS

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and stage coach stop for early-day miners. The standard gauge train which made the visit to the plant, was met by William Wallace Mein, Jr., president of the cement company, who was host for the tour.

Increase Martinsburg Output

AMERICAN-MARIETTA CO., Chicago, Ill., has announced that new cement production facilities of its subsidiary, Standard Lime and Cement Co., Martinsburg, W. Va., are now in operation. Standard's new facilities will have an estimated capacity of 1,400,000 bbl. annually.

Equipment orders for the recently announced expansion of American-Marietta's Southern Cement Co. Division plant at Roberta, Ala., have now been placed. Scheduled for April 1957 completion, the expansion will increase output by 60 percent.

$20 Million Gypsum Expansion

NATIONAL GYPSUM CO., Buffalo, N.Y., has secured $20 million through a stock issue. Development of a northern Michigan deposit near Lake Huron will require $6 million. About $13 million will be spent for two plants in the Great Lakes region. Wallboard, lath, plaster and other gypsum products will be manufactured.

During 1955 National Gypsum developed deposits in Indiana and Nova Scotia. A Quebec asbestos mine is being opened this year.

Sand and Gravel HMS Unit

SOUTHERN PACIFIC MILLING CO., Sisquoc, Calif., is operating the first HMS plant in the sand and gravel industry on the Pacific coast. Cook Brothers Equipment Co. and Western Machinery Co. designed and equipped the plant, which will double Southern's capacity in the area.

N.I.S.A. Elects New Officers

NATIONAL INDUSTRIAL SAND ASSOCIATION, Washington, D. C., elected these officers: Emery M. Durstine, Keener Sand and Clay Co., president; William J. Cannon, Nugent Sand Co., vice-president; and A. B. Schlesinger, New Jersey Pulverizing Co., treasurer. The nine directors were elected for varying terms to adjust to a new staggered-election system.

Virginia Seeks New Cement Plant

STUDIES conducted by the State Division of Planning and Economic Development, Richmond, Va., indicate that a cement plant could be located in the seven-county southwest Virginia triangle. The study was prompted by decreasing employment in the region's major industry—coal.

Complete Fluorspar Mine

PENNSYLVANIA SALT MANUFACTURING CO., Philadelphia, Penn., has completed its Dyer's Hill fluorspar mine at Crittenden County, Ky.

The Dyer's Hill mine has a potential capacity substantially in excess of current requirements to enable it to adequately supply the company's rapidly expanding chlorine - fluorine facilities at Calvert City, Ky.

Gypsum Plant Opens

PABCO BUILDING MATERIALS, Florence, Colo., Div. opened Colorado's first plant to produce gypsum wallboard, sheathing and lath. Plant opened June 6. B.K. Comann, resident engineer during construction, will manage the plant located on a 46-acre tract four miles east of Florence.

Operates County Quarries

LAMBERT BROTHERS INC., Knoxville, Tenn., has taken over operations of Knox County's five quarries. Title to the land will remain with the county. Lambert will supply crushed stone to the county at $1.20 per ton, about half the former cost when the quarries were operated by convict labor. Crushed stone also will be sold commercially.

Empire State Meeting

EMPIRE STATE SAND, GRAVEL AND READY MIX ASSOCIATION, Buffalo, N.Y., held its annual meeting at Elmira.

George Southworth, Master Builders Co., discussed "Use of Admixtures in Producing Quality Concrete". A slide illustrated paper on "Field Experience and the Effect of the Test for Cement Content of Plastic Concrete" was given by William McIntosh of Portland Cement Association. Most everyone attended a forum on "What Makes Good Concrete".

Cement Plant for Miami

GENERAL PORTLAND CEMENT CO., Chicago, Ill., will build a 2,500,000-bbl. annual capacity cement plant 19 miles west of Miami, Fla. The plant site is being cleared with building to start in November.

Planned as a 1,250,000-bbl. plant, market research indicated the necessity of doubling the planned capacity thereby increasing the building costs to $15,000,000.

Marquette Ups Capacity

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., informed stockholders that the 3,000,000-bbl. added capacity now under construction will all be completed by the end of this year. President W. A. Wecker stated that, with the facilities coming into use during the year, Marquette should show a production increase of 5½ percent.

Wage Agreement

FIVE MAJOR CEMENT PRODUCERS have entered into an agreement with the Cement, Lime and Gypsum Workers. Alpha Portland Cement Co., Lehigh Portland Cement Co., Marquette Cement Manufacturing Co., Medusa Portland Cement Co. and Penn-Dixie Cement Corp. signed new contracts providing an 18-cent hourly increase across the board, improved health - and - welfare benefits and a seventh paid holiday.

Coming Conventions

July 12-13, 1956—
National Crushed Stone Association, Board of Directors Meeting, Lake Placid Club, Essex County, N.Y.

October 1-4, 1956—
American Mining Congress, Metal Mining and Industrial Minerals Convention, Shrine Exposition Hall, Los Angeles, Calif.

October 10-12, 1956—
National Lime Association, Operating Meeting, Kentwood Arms, Springfield, Mo.

October 22-26, 1956—
National Safety Congress and Exposition, Conrad Hilton, Congress, Morrison and LaSalle Hotels, Chicago, Ill.

November 12-19, 1956—
American Concrete Pressure Pipe Association, 8th Annual Convention, Castle Harbour Hotel, Tucker's Town, Bermuda.

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Aggregate used for multi-aggregate bituminous mix *must be accurately sized* to meet today's exacting specifications. That's why prominent asphalt plant manufacturers *standardize* on Symons Type F Horizontal Vibrating Screens.

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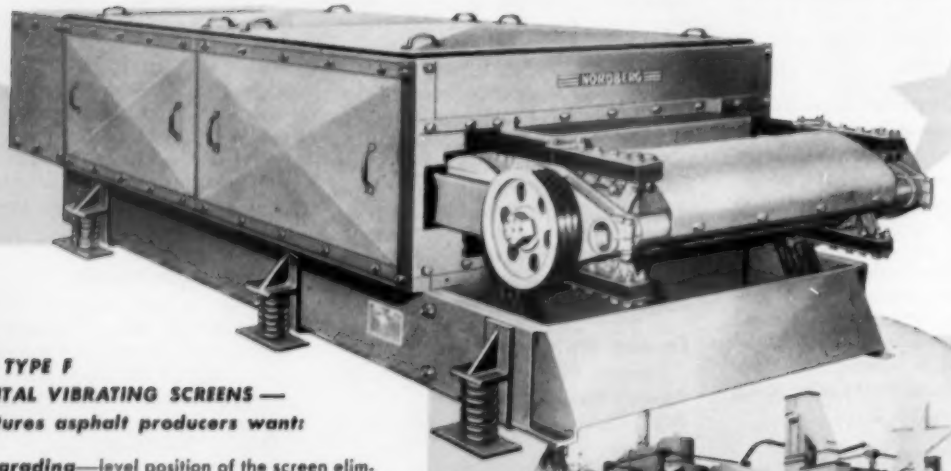
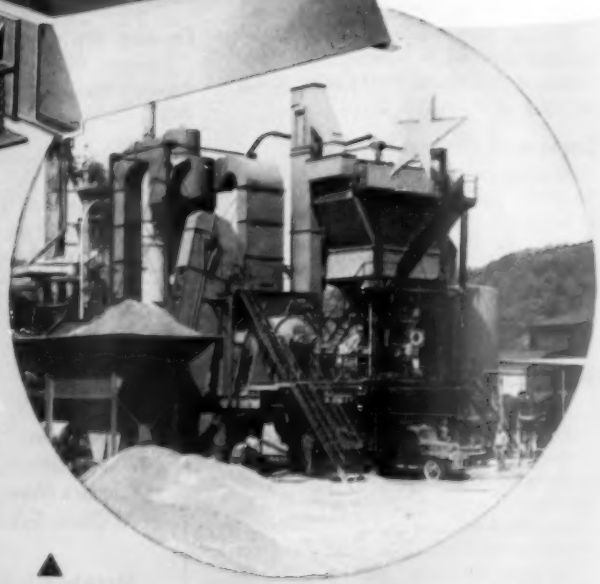
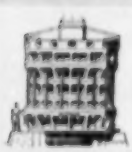




SYMONS TYPE F HORIZONTAL VIBRATING SCREENS — Features asphalt producers want:

- ***Better grading***—level position of the screen eliminates bouncing and cascading of material along deck and leaves the full opening of the mesh available for screening. Positive action thoroughly agitates material and more quickly stratifies it for closer sizing.
- ***High capacity***—positive vigorous screening and conveying action gives the "F" Screen greater capacity than is possible with inclined type screens.
- ***Adaptability***—installed in a level position with low overhead requirements, the "F" Screen shortens elevators, simplifies construction and reduces overall dimensions of the plant. Being free from vibration, there is no tendency to shake scales or other measuring devices.
- ***Multiple separation***—with multiple decks and many varied screen sizing possibilities, including gap, lower deck, versatility of sizing to meet any specification is possible with the "F" Screen.
- ***Low maintenance***—drive unit with bearings and motor are located outside the screen housing, away from dust and heat.

▲ ***Standard Equipment on SIMPLICITY Plants.*** "We have long standardized on the use of Symons Screens in Simplicity Plants. One big reason is that highway engineers realize that accurate screening means much to the durability of finished asphalt pavements," says Wm. C. West, of The Simplicity System Company.



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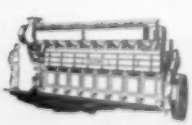

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mixing plants

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Standard Equipment for MADSEN. Madsen Works has used Symons Screens exclusively (unless otherwise specified by customer) since 1930. Here's why, says W. M. Madsen, V.P., Research & Development:—"Accuracy of sizing with a minimum of carry-over; simple to adjust; easily serviced; rugged, simple, accessible and well designed."

◀ ***Used Exclusively by WARREN BROTHERS CO.*** "In the past eight years we have installed close to forty Symons Screens of various sizes. Our satisfaction with their performance must be apparent," says R. C. Paine, Chief Engineer.

▲

Preferred by KOEHRING-WATEROUS, LTD. "We use Symons Screens because they have complete customer acceptance. We like the design which permits the drive unit to be mounted completely outside a dust enclosure over the screen, away from dust and heat," says N. L. Elliott, Manager, Road Equipment Sales Division.

▲

Specified by STANDARD STEEL CORP. "We utilize the Symons Screen on all our plants and find them to be especially suitable due to their ruggedness, high gradation control, and because the operating mechanism is away from the heat," says M. B. Freeman, Manager, Road Machinery Division.

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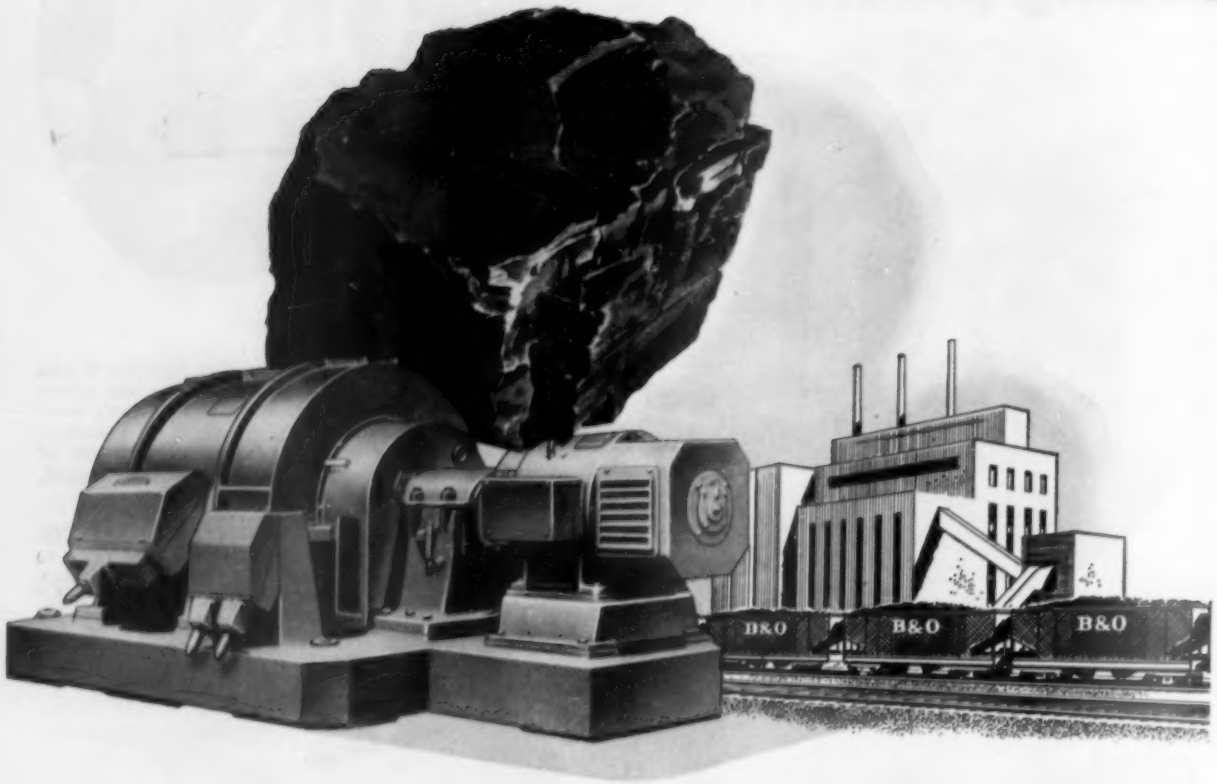

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HINTS AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Replaceable Bar Grizzly

A SOUTHERN CRUSHED STONE PLANT uses a 42- x 48-in. Lippmann overhead eccentric jaw crusher as a primary unit with an apron feeder delivering stone to the crusher. Between the

Grizzly with replaceable steel bars faced with manganese steel

feeder and the crusher is placed a company-made grizzly of special design, having individually replaceable steel bars which are faced with manganese steel.

Throughs from the grizzly drop to a belt conveyor, but before the stone reaches the belt it passes over a second grizzly of similar construction. This second unit is so installed that the finer stone hits the belt first and acts as a cushioning bed for the coarser fragments thereby prolonging the life of the belt.

Hard-Surfaced Dredge Cutter Head Increases Life

A LARGE SOUTHERN DREDGE OPERATION uses a 20-in. pump with a 7 ft. diameter cutter head at the suction end. The cutter head, which is made up of six spiral blades with 10 teeth per blade, operates at 18 r.p.m. through a 9-in. diameter drive shaft. It is driven by a 200 hp. Allis-Chalmers motor. A Philadelphia gear reducer has been installed between the motor

A 7-ft. diameter dredge cutter head which is built up with hard surfacing from time to time

and the shaft. Hard surfacing alloys are used to build up the cutter head from time to time. The cutter head is essential as a strata of hard pan is located below the water line. Dredge production is from 1000 to 1400 t.p.h.; mostly fine sand.

Safe Reclaiming Tunnels

IN MANY WESTERN STATES where underground mining is one of the principal industries, any underground opening has to have two openings to the surface. This is a safety precaution as the surface building at the collar of a shaft or the portal of a tunnel may catch fire placing men underground in peril.

A reclaiming tunnel under a stockpile is therefore often classed as an underground mine and must have at least two outlets. The illustrations show the opening and interior construction of a well-built reclaiming tunnel in the South which meets this requirement.

The tunnel is of concrete block construction reinforced with "square-sets" of steel. At the opening steps are provided, and any heavy equipment can be pulled up the incline alongside the steps. A Safety First sign over the portal is a timely reminder to workmen.

Clean-up Containers

MODERN WAREHOUSES in the rock products industries are very often quite large. Some of them have floor space

Refuse containers are spotted with lift trucks at strategic points in large warehouse

in excess of 250,000 sq. ft., such as found in the gypsum wallboard plants.

Keeping such a large area clean requires mechanical floor sweepers and

(Continued on page 51)

Illustrations show concrete block reclaiming belt tunnel and the interior reinforced with steel "square-sets"

HERE'S A MAN-SIZED JOB

This is one of six CAT* DW21s with No. 21 Scrapers which handled *one million tons of clay and rock* during a Nevada winter. Working 20 hours a day, six days a week, these machines stripped overburden at a copper pit near Kimberly. Each unit loaded 15 bank yards in one minute (push-loaded by a Caterpillar D8 Tractor), made the half-mile round-trip haul, and then dumped in 25 seconds. These fast-working yellow rigs are owned by Young & Smith Construction Co. of Salt Lake City, Utah.

Outstanding though this production record is, there is now a *new* Caterpillar DW21 (Series C) and No. 470 Scraper with LOWBOWL design which will move even *more* material in *shorter* time at *less* cost per yard. Its new four-cycle diesel engine develops 300 HP (maximum output) and has a Turbocharger which packs in air according to load, not speed, for more working horsepower and greater performance.

With LOWBOWL design, the 25-yard (heaped capacity) No. 470 Scraper can handle bigger payloads faster than ever before. The bowl is shallower, wider and longer than old-fashioned scrapers for less resistance throughout the loading cycle. In on-the-job tests, the Cat DW21 and No. 470 Scraper handled at least 20% more material than any other unit in its class.

Whether for coal or metal mining, the application of the Caterpillar DW21 and No. 470 Scraper is the same. With ample power, large capacity, and wide-footprint tubeless tires for good flotation, this big yellow team can speed production and cut costs on *your* operation. Your Caterpillar Dealer—who provides skilled service and parts you can trust—will gladly give you full details. Call him soon.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

a place to dispose of the refuse which has been swept up. At one warehouse front-end lift trucks spot containers, similar to the one shown in the illustration, at strategic places about the warehouse.

Rapid Weighing Scales

IN THE ILLUSTRATION may be seen a scale set up by which cars can be weighed or by-passed. The Howe

Track scales arranged so that cars can be quickly weighed or by-passed

scales of 75-ton capacity have the weight bridge arranged for dead rail operation, and are also equipped with Streeter-Amet automatic weigh beam recorder.

Protecting Conveyor

AT A CRUSHED STONE PLANT producing metallurgical stone, a reclaiming belt conveyor was protected at the issuing portal from rolling stone in the stockpile by a shelter or gallery as shown in the illustration.

When the storage pile was built up to near capacity there was always a danger from stone rolling down the pile and cataracting into the throat

Gallery shelter over reclaiming belt conveyor protects belt from stone which may roll down from stockpile and also from stone dropping off conveyors above

of the tunnel. As other belt conveyors carrying stone also were carried over the reclaiming belt conveyor, the gallery as shown in the accompanying illustration, offered added protection.

Showing shock absorber springs in "deadman" installation of car puller

"Deadman" for Car Puller

TO LESSEN THE SHOCK ON THE CABLE, sheaves and related assemblies of a car puller, tension springs were installed as shown in the illustrations. The operator of this plant found the shock absorbers very effective in preventing undue strain on cable and mechanism.

Tube Mill for Better Wallboard

TO MAKE A LIGHTER WALLBOARD without sacrificing strength, a gypsum plant uses a small amount of perlite

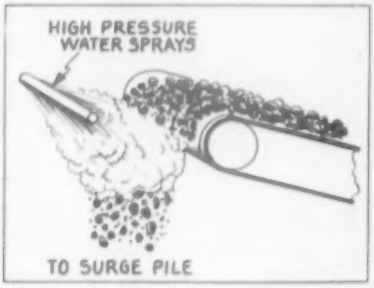
Wallboard stucco is reground in tube mill for a better product

in the core of the wallboard. By regrinding the stucco with perlite that goes into the wallboard, certain additional advantages are obtained. The mill is a 4- x 22-ft. Marcy which grinds 25 t.p.h. to a fineness from 1700 to 2100 Blaine.

Dust-Free Stockpiling

A WESTERN CRUSHED STONE PRODUCER uses a series of long belt conveyors from the primary crusher in the quarry to the plant. At the end of each belt conveyor section is a surge pile.

At the end of each conveyor section high pressure water sprays have been installed with fine sprays impinging into the stone falling to the surge pile. Dusting has been reduced to a minimum, using a small amount of water and without appreciably wetting the



Showing how high-pressure water sprays cut down dust at the end of belt conveyors using a small amount of water

stone. No chemical wetting agent is used in the spray system.

Lime Prevents Stream Pollution

ONE OF THE PROBLEMS faced by rock products companies is stream pollution. Laws have been passed in many states which prohibit the emptying of dirty water into drainage systems and therefore tailing ponds or settling basins are a "must."

A southern operator provided large settling basins but the slimes would not settle. By first making the pulp slightly acid with sulphuric acid and then neutralizing with lime, the solids in the slimes settled very rapidly. The illustration shows the lime feeder building. Skids under the building make it portable.

Portable lime feeder building supplies lime for settling slimes

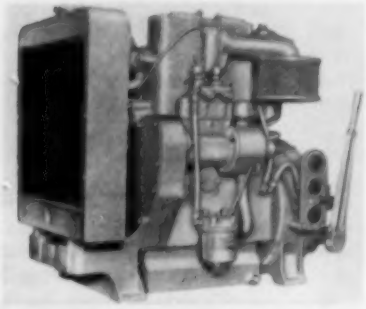
NEW MACHINERY

Rock Drill Bit

BRUNNER & LAY ROCK BIT CORP., 9300 King St., Franklin Park, Ill., has announced the addition of a 6-in. Rok-Master bit to its line of percussion rock drill bits. The bit is for use on Ingersoll-Rand Quarrymaster drills, and features 2 x 3 A.P.I. threads, a super-tough bit body, with fast drilling carbide inserts which are said to be resistant to wear and shock.

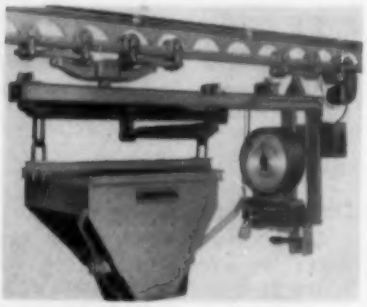
Pocket Penetrometer

SOILTEST, INC., 4711 W. North Ave., Chicago 39, Ill., has introduced a pocket penetrometer for field and laboratory classification and evaluation of shearing strength of cohesive types of soils. It was developed on the basis of correlation studies which indicated a close relationship between the penetrometer readings and the soil type. In operation, the penetrometer piston is pushed into the soil up to the calibration groove. A pointer attached to the penetrometer's calibrated spring assembly indicates the reading in tons per sq. ft. or kilograms per square centimeter unconfined compressive strength. The complete unit weighs 4 oz., has a diameter of ¾ in., and is less than 7½ in. long.



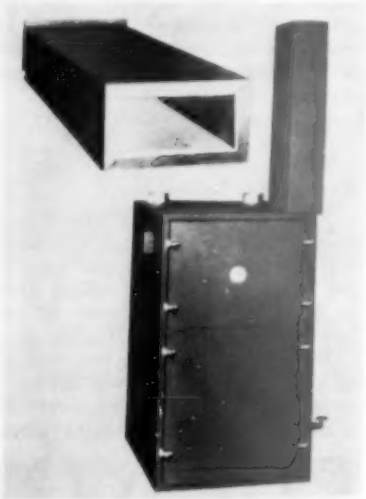
Diesel Engines

R. H. SHEPPARD CO., Hanover, Penn., has introduced the Model 17A diesel engine, an addition to its line of diesel power units and generating sets. Comparable in size and weight to 20 hp. gasoline engines, it is a two-cylinder unit, has a 3½-in. bore and a 76.8-cu. in. displacement. The fan to flywheel unit measures 26 in. high, 22¼ in. long, and less than 17 in. wide. It is also available as an open, standard and closed power unit, to meet a variety of requirements. The Model 17A is also offered as a 5 to 7½ kw. generating set.



Traveling Hopper and Scale

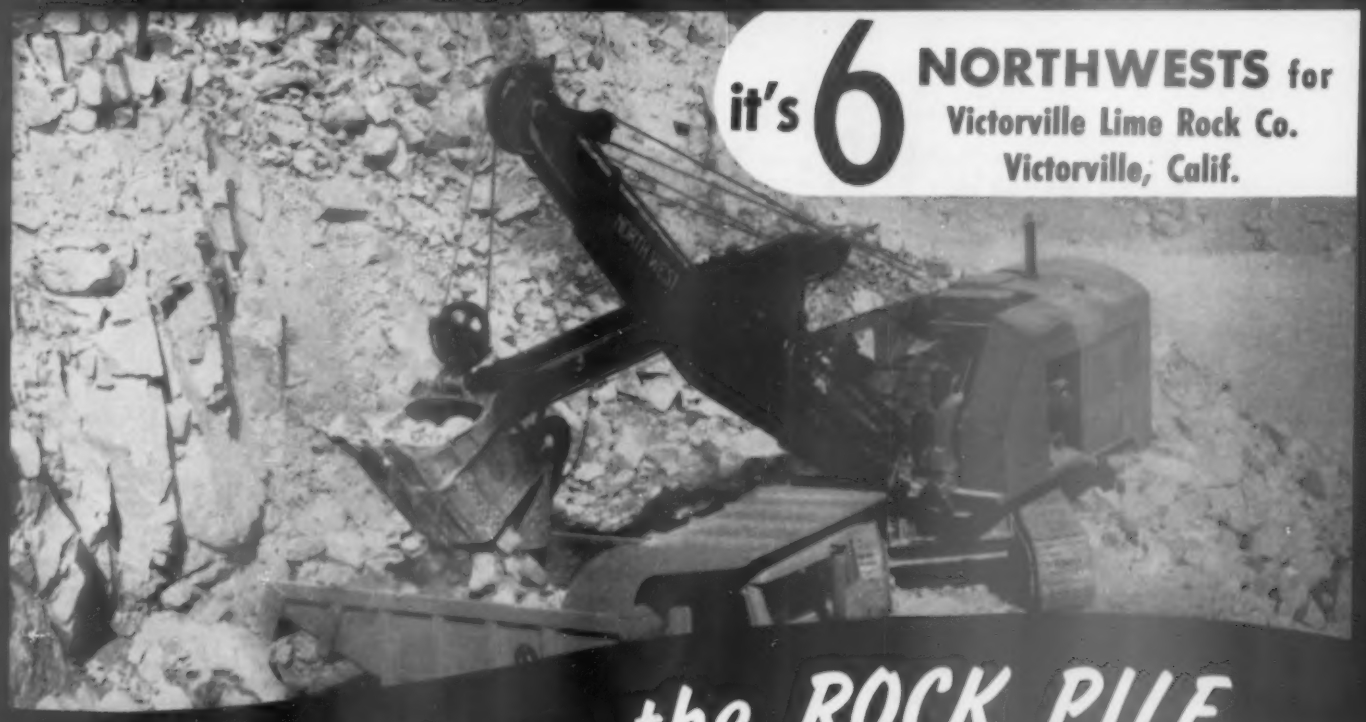
THE CLEVELAND CRANE & ENGINEERING CO., Cleveland Tramrail Division, Wickliffe, Ohio, has developed a tractor-driven traveling hopper with a scale for handling bulk materials. The hopper is of 1-cu. yd. capacity, and is so located with respect to the track on which it travels that an extra large opening is provided at the top for filling. It is emptied by means of a bottom gate which can be manipulated from both sides of the bucket. A 5000-lb. dial scale with tare beam permits weighing of material as it is gathered from overhead storage bins. Spring clip markers on the scale facilitate weighing when similar batches are made up repeatedly. The load bar supporting the bucket and scale rides on 12 ball-bearing equipped wheels. The unit is propelled by a Cleveland Tramrail tractor drive at 150 f.p.m., with push button automatic accelerating controls.



Dust Collector Silencer

TORIT MANUFACTURING CO., St. Paul, Minn., has announced an "Exhaust Silencer" designed to provide quiet operation on Torit cabinet-type dust collectors. It is available in five models to fit the exhaust openings on the 50, 60, 70 and 80 Series and the Model 122 collectors. The three smaller models are made of 20-gauge steel and extend 30 in. above the top of the collector; the two larger models are built of 16-gauge steel and extend 36 in. All five are rectangular in cross-section and are interlined with 1-in. closed cellular vinyl foam which is said to absorb about 80 percent of the noise without restricting the flow of air through the unit.

(Continued on page 55)



it's 6 NORTHWESTS for Victorville Lime Rock Co. Victorville, Calif.

ABILITY on the ROCK PILE makes REPEAT ORDERS

LOOK at that Rock Pile! Ability to handle stuff like this is what backs up our statement, "that when you have a Northwest you have a *real* Rock Shovel and if you have a real Rock Shovel you never have to worry about output in any digging." Performance in digging like this makes repeat orders. That's the reason why Victorville Lime Rock Co. of Victorville, California, and other responsible contractors buy Northwests again and again.

Northwest design begins from the bottom up for rock work — cast steel machinery bases and machinery side frames, crawlers that give self-cleaning action and more easily negotiate tough going, the Cushion Clutch that eliminates shock overloads to parts under power, the "Feather-Touch" Clutch Control for easier handling. Uniform Pressure Swing Clutches that take the jerks and grabs out of swinging, the Northwest Dual Independent Crowd that utilizes force most other independent crowd shovels waste — these are but a few of the advantages that Northwest Rock Shovels bring you, and remember, if you have a *real* Rock Shovel you never have to worry about output in *any* digging. With the advantages and proved performance of a Northwest it's no wonder Northwest owners come back!

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NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Convertible for any Mining Material Handling or Excavation Problem

BUILD BETTER ROADS TODAY FOR A GREATER AMERICA
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957
AMERICAN ROAD BUILDERS ASSOCIATION

Announcing...

THE ALL-NEW COMPLETELY REDESIGNED Cedarapids JUNIOR TANDEM

Here's the *brand new* Cedarapids Junior Tandem, completely redesigned from hopper to delivery conveyor.

Many new features added to the ruggedness and stamina of the original Junior Tandem make this time-tested "workhorse of the Iowa line" a more versatile plant, with greater capacity and lower maintenance.

Use the new Junior Tandem, with your choice of crushers, to meet any pit condition . . . or with a Cedarapids Portable Primary for low-cost rock crushing.

with these BIG NEW FEATURES

YOUR CHOICE OF CRUSHER SIZES

Whatever your pit conditions, you can meet crushing requirements right on the nose! With high crushing percentages, use the 10″ x 36″ jaw crusher for extra primary capacity. In average conditions, choose the 10″ x 24″ jaw crusher. Meet normal secondary reduction requirements with a 24″ x 16″ roll crusher, or where percentages of fines are high, use the 30″ x 18″ roll crusher. Mix 'em and match 'em for *balanced production on your job!*

BIGGER SCREEN

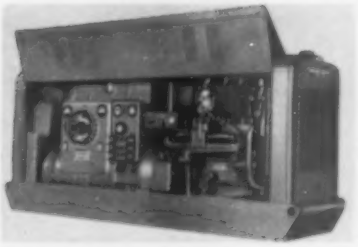
The width of the horizontal vibrating screen has been increased 6 inches, and a half deck has been added. Now the 42″ x 10′, 2½-deck screen assures much higher screening capacity, plus greater flexibility for producing from one to three products simultaneously in sizes from 2″ road ballast down to minus ¼″.

CEDARAPIDS "BIG PLANT" FEATURES

In the new Junior Tandem are many features found in larger Cedarapids plants—sand ejector screw; washing spray bars (optional); new mono type elevating wheel; delivery conveyor backstop; belt wipers; self-cleaning pulleys; new type adjustable eccentric on reciprocating feeders; larger hopper; separate clutch control on screen.

Write for details today! **Only a *complete* description of every improved feature on the new Junior Tandem can show you what this plant can do on your job. Write for information, or see your nearest Cedarapids distributor for design details and specifications.**

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.



Combination Welder-Power Unit

HOBART BROTHERS CO., Troy, Ohio, has brought out a gasoline engine driven d-c arc welder, with 6 kw. or 12 kw. a c auxiliary power, available in 300 and 400-amp. size. The welding control panel is equipped with a current range hand wheel, volt-amp. adjuster and welding cable connecting studs. A welder ammeter and voltmeter are optional. When the welder and power generator are in use at the same time, the 300 amp. model can be used under a combined load, d-c and a-c, 18 kw.; the 400-amp. model can be used under a combined load, d-c and a-c, 24-kw.

Dust Collector

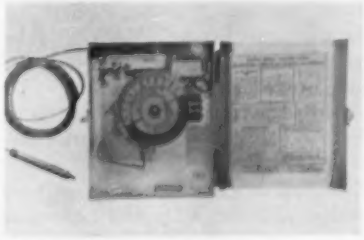
RESEARCH-COTTRELL, INC., Bound Brook, N. J., has brought out the "Cyclo-trell," a multiple-tube centrifugal dust collector, consisting of a series of cyclone tubes arranged in parallel. The incoming gas enters the chamber under pressure and flows into a lower set of inlet tubes. Specially designed inlet vanes at the mouth of the inlet tubes set up a circular motion so that suspended particles are forced downward and outward against the wall of the inlet tube. Cleaned gas is forced to the center of the collector tube, then upward to the outlet tube by the pressure differential. The use of aerodynamically shaped vanes is said to minimize gas turbulence and increases the centrifugal force. The shell and hopper of the unit are of seven-gauge bolted steel construction, with cast iron inlet tubes and vanes to resist the abrasive force of incoming gas.

Multiwall Bags

ST. REGIS PAPER CO., New York, N. Y., has developed a multiwall bag construction featuring structural strips used to reinforce the gusset areas and the edges of the bags, where the greatest stress occurs. No gluing is required on valve bags, but the structural strips are spot pasted in sewn open mouth bags to prevent shifting.

Carloader Conveyor Belts

THERMOID CO., Trenton, N. J., has developed "thrower" or "slinger" belts for handling large quantities of bulk materials in carloading. The belts are of special construction to combat high speeds, small pulleys and chemical reaction of materials handled, and are available in three sizes: 24 in. wide x 4 ply x 7 ft. 10 in. long; 10 in. wide x 4 ply x 6 ft. long; and 16 in. wide x 4 ply x 5 ft. 8 in. long. The slinger unit shown above receives material from a shuttle conveyor and delivers it in a pile 9 ft. high up to 35 ft. from the slinger.



Heating Time Switch

AUTOMATIC DEVICES CO., INC., 714 Hillgrove Ave., Western Springs, Ill., has developed a time switch which automatically regulates the hours of building heating and divides the day into three periods of heating. Known as the "Weather-Cron," it contains two switch circuits, the first operating the burner or valve and the second switch connecting, at a pre-selected time, the "daytime" heat flow controller with the circuit to provide a regulated heat flow throughout the day. The heat flow is stopped or reduced at a pre-selected night-time hour.

Off-Highway Haulers

INTERNATIONAL HARVESTER CO., Chicago, Ill., recently added to its line of heavy-duty construction machinery equipment two new off-highway rear-dump trucks—the 18- and 24-ton International Payhaulers. The company's entries into the off-highway market with the two new models are said to have greater horsepower to payload weight ratio than are now available. They are also reported to have stronger main frames, reduced maintenance cost, higher speeds, full power hoists and better visibility. The two models of Payhaulers are the result of testing in the field on 44 different contracting, mine, quarry, and other field applications.

Overall dimensions of the 95 Payhauler equipped with a standard body are as follows: wheel-base, 13 ft. 9 in.; length, 26 ft. 1 in.; width, 11 ft. 6 in.; loading height, 9 ft. 2 in.; turning radius, 30 ft. 5 in.; track, front, 86 in.; rear, 92⅛ in.; empty weight (with quarry body), equipped with torque converter, 47,980 lb.

The Model 65 Payhauler has a wheelbase of 13 ft. 2 in.; length, 24 ft. 11 in.; height, 11 ft.; width, 10 ft. 8⅜ in.; loading height 9 ft.; clearance under the front axle, 15 in.; clearance under drive axle, 14⅝ in.; turning radius 29 ft. 3 in.; track, front, 82⅜ in.; rear, 84¼ in.; and empty weight, with quarry body, equipped with a 5-speed transmission, 39,865 lb.

The two units are powered by Cummins Turbo-charged diesel engines, the larger developing 335 hp. at 2100 r.p.m., and the smaller, 250 hp. at 2100 r.p.m. Top speeds for both models are 37-38 m.p.h.

A large radiator with 1425 sq. in. of area, plus the 32-in. fan, eliminates

(Continued on page 57)

Belt conveyor scale and instrument
Read-out to auto-typewriter or tape puncher
Punch card operated sequence batcher
Desk instrument for weighing
Desk instrument for weighing and printing

Now...we're way beyond weighing–electronically!

The Fairbanks-Morse line of electronic instrumentation performs many functions beyond the elementary process of weighing. It will, for instance, register and record weights at a remote location. It will perform automatic sequence batching—say, from a punch card. It will translate weight messages into the language understood by automatic typewriters, automatic adding machines, tape punchers, other data processing machines. It will control a complete plant materials flow program.

This instrumentation is now available with Fairbanks-Morse truck and track scales, axle-load scales, warehouse and portable scales, and many other types of weighing machines.

The weight message is created in the electronic load cell. Fairbanks-Morse employs it in two ways. The *Full Electronic* system utilizes multiple load cells. In the *Levetronic* system, a single load cell is incorporated in a conventional lever system. (Your present lever scale can probably be converted to *Levetronic*.)

New Fairbanks-Morse literature is available on all these electronic scales, batchers and instruments. Write today. Fairbanks, Morse & Co., Scale Division, Dept. RP-7, 600 S. Michigan Ave., Chicago 5, Ill.

FAIRBANKS-MORSE
a name worth remembering when you want the BEST

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MOWERS • MAGNETOS

overheating on both models. In torque converter models, heat problems are eliminated by using a large capacity built-in heat exchanger. In models equipped with conventional transmissions, cerametallic clutch facings eliminate overheating.

The Model 65 can be equipped with a quarry body; the Model 95 with a standard body, a quarry body, or an exhaust-heated body. The bodies are raised by hydraulic double-action hoists, with a dumping angle of 65 deg. Both Payhauler models have 125 gal. fuel tanks, and are also equipped with tubeless tires.

Other features include spacious leather-covered, fully adjustable seats; compression-spring hydraulic shock absorbers to reduce jars; center-grouped, easy-to-reach controls; full-time power steering, and two-piece windshield with excellent vision ahead and to both sides.

Heavy-Duty Trucks

INTERNATIONAL HARVESTER CO., 180 N. Michigan Ave., Chicago 1, Ill., has brought out the "V-Line" of heavy-duty trucks, featuring three V-8 engines. Nine series of trucks in conventional and cab-over-engine, four and six-wheel design, comprise the V-Line. Models are available with gross vehicle weight ratings of 24,000 lb. and up, and gross combination weights of 50,000 lb. and up. Power is supplied by V-8 engines of 401, 461 and 549 cu. in. displacement with horsepower ratings of 206, 226 and 257, respectively. The engines are additions to the line of six-cylinder Red Diamond gasoline and liquified petroleum gas engines, and diesel engines available in the International heavy-duty truck models.

Conventional four-wheel models are available in the line in the Model V-195, and the V-200, V-210, and V-220 Series; and conventional six-wheel models are included in the VF-190 and VF-200 Series. Cab-over-engine models are available in the VCO-195, the VCO-200 Series, and the VCO-220 Series.

Electronic Metal Detector

RADIO CORPORATION OF AMERICA, New York, N. Y., has developed an electronic metal detector for use in crushing, mining and cement operations. It features automatic drift control, an electronic circuit that holds the "inspector's" detection sensitivity at a constant level regardless of temperature fluctuations. A special electron tube is incorporated, which operates at less than half the rated value, providing longer tube life and operating reliability. A heavy-duty bi-sectional aperture frame, constructed of marine mahogany, facilitates the installation and removal of the frame without cutting endless-type conveyor belts. Electrical connection of the two sections is completed by soldering terminal boards mounted on each section.

Designed for the special requirements of heavy industry, it provides continuous inspection of material traveling through the detection aperture at conveyor-belt speeds of from 25 to 1000 f.p.m. It can be installed so that upon detection of the tramp metal, it will trigger any one or a combination of three alarm systems, stop the conveyor belt, sound a horn or bell, or activate a warning light. It will detect the presence of any kind of tramp metal or alloy, magnetic or non-magnetic, including bauxite ore, manganese, copper, aluminum, brass, and stainless steel. The aperture frame is available in standard sizes up to 32 in. high and 72 in. wide. Larger apertures are available on a custom-order basis.

Power Scrapers

INTERNATIONAL HARVESTER CO., Chicago, Ill., has introduced a new 1956 line of self-propelled, rubber-tired Payscrapers, including the 262-hp., 20-cu. yd. Model 75 Payscraper and the 172 hp., 14-cu. yd. Model 55 Payscraper. Both have stepped-up capacity and increased efficiency.

The back of the new Payscraper bowl has been shaped like a dozer blade, enabling dirt to flow up and back and heap exceptionally well to top and sides, eliminating voids. A new, lowered draft frame and larger push-block directs push and pull power more effectively to reduce loading time. Another added feature is a new apron design, with apron arms outside the bowl away from the dirt, allowing the apron to close quickly and positively.

Operator safety and comfort have been improved through longer, wider fenders, excellent vision from the roomy operator's seat and centralized controls. Power steering is standard equipment.

Another important change on the "75" Payscraper is the introduction of the cerametallic clutch. Four-wheel air brakes are synchronized on both tractor and scraper wheels. Conveniently located auxiliary hand brakes also provide individual braking of drive wheels. The Payscraper has a top speed of 24 m.p.h., ample ground clearance, and a low center of gravity for maximum stability.

Rear-Engine Tractor-Shovel

INTERNATIONAL HARVESTER CO., Chicago, Ill., introduced its Model 12 Payloader, five years in the testing and developing state, to a group of construction magazine editors on May 15. The unit, which is a rear-engine, 1¾-cu. yd. tractor-shovel on crawlers, is the result of a wealth of experience gained from producing and selling approximately 25,000 rubber-tired tractor shovels by the Frank G. Hough Co., a wholly-owned subsidiary of International.

Highlights include 91½-hp. UD-350 diesel engine in rear; better balance and stability; full power shift transmission and torque converter drive; power-boosted steering and brake controls; high break-out; 40 deg. bucket tip-back at ground level; a unique body tilt which facilitates maintenance (illustrated); adjustable operator seat with foam rubber cushion; closed hydraulic system with pressure control; hydraulic system accumulator; 1¾-cu. yd. capacity; 8-ft. 10-in. discharge height, and three forward speeds from 0 to 10.1 m.p.h. and three

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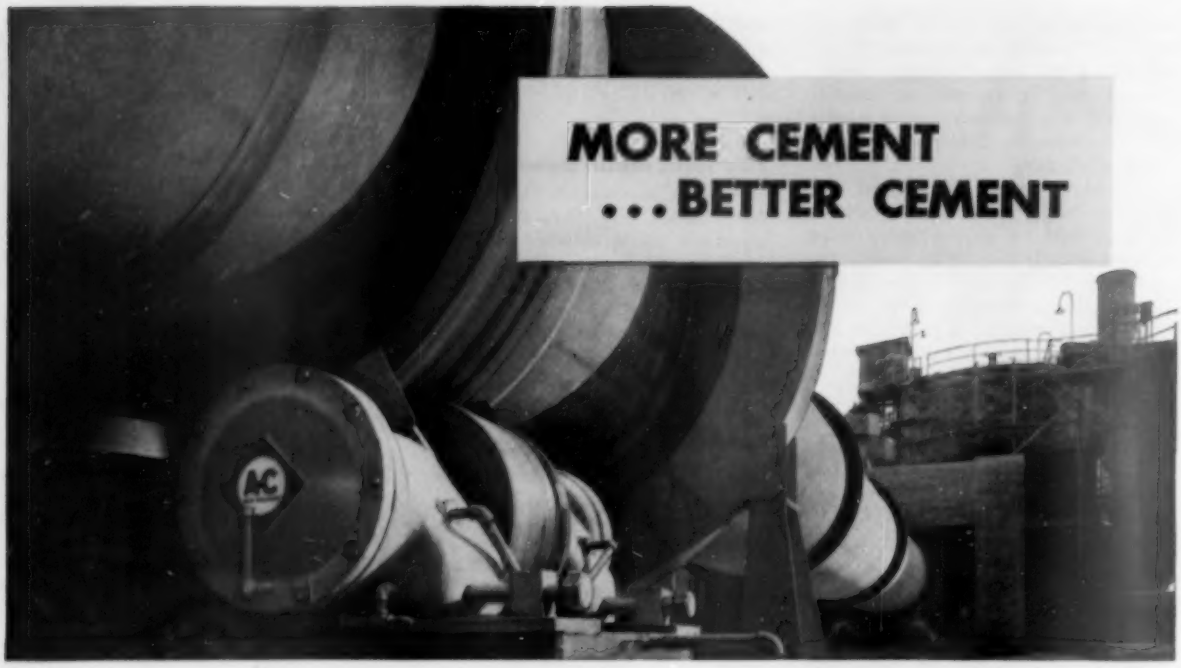


Are you set up to meet Volume and Specification demands?

Accelerated construction programs call for a 35% increase in cement production by 1959. You're in for some profitable years if you gear your plant to meet the challenge.

Allis-Chalmers Can Help You and Your Consultants

Evaluating your present process should be your first step in expanding. Here is where Allis-Chalmers — with more than 50 years' experience in building and applying cement-making equipment — can help.

Allis-Chalmers is not only concerned with machinery application, but with overall plant efficiency. Increased grinding and burning capacity — better heat recovery — faster clinker cooling — maximum fuel utilization — lower power consumption — maintenance economy — are all vital considerations. Only with this approach can you achieve capacity increase and quality improvement at the lowest cost.

Yes, you get more . . . more engineering cooperation when you specify A-C.

Allis-Chalmers Rotary Kilns

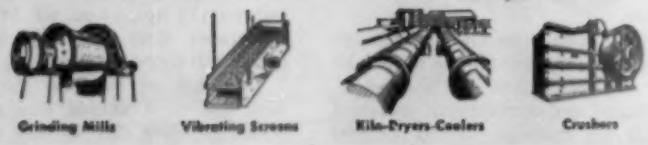
Over half of all cement made in the U. S. is processed in A-C equipment. The reason? Allis-Chalmers has pioneered many major improvements in machinery design. For example, air-cooled kiln feed and discharge ends save rebricking cost and prevent shell distortion. True circle, all-welded construction insures best lining fit, long refractory life. Floating-type riding rings provide flexible support and proper weight distribution.

For complete information, see your local Allis-Chalmers representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-4970

"Coordineered" Equipment for the Cement Industry



reverse speeds from 0 to 13.1 m.p.h. Shifting can be made up or down—forward or reverse at any time and at any throttle setting.

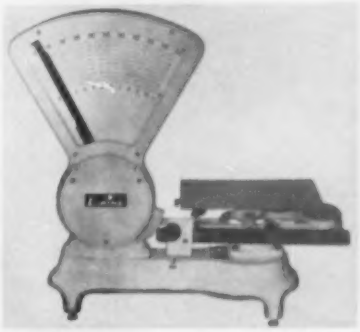
The general arrangement and weight distribution of the Model 12 is such that an optimum weight distribution through the full length of the track can be gained without a counterweight (the engine serves as a counterweight). This is expected to extend the life of the track chains, idlers, roller, and other track parts. The operator sits in the center, permitting him to see what his bucket is doing and giving him a more comfortable ride.

The Model 12 Payloader has been designed to make service simple and easy. By removing two pins at the rear of the loader, releasing two jack screws at the front and applying up pressure to the boom, the body tilts up to expose the rear deck of the main frame and bottom of the engine. In addition there are no boiler plate, hood or side sheets to be removed for such simple operations as checking oil, etc.

Gas Analyzer

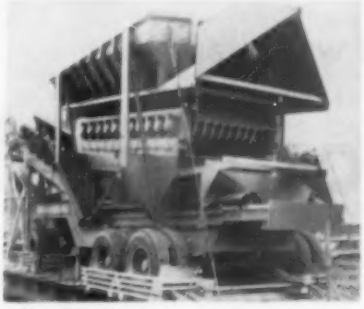
ARNOLD O. BECKMAN, INC., 1020 Mission St., South Pasadena, Calif., has brought out the Model 7C thermal conductivity type analyzer for measuring various process stream gases, such as carbon dioxide, hydrogen, ammonia, etc. The instruments are designed individually to meet the particular requirements of an application, made possible by the use of various standard components, and when required, specially-designed components. Single or multiple ranges are available, and a choice of three outputs permits the use of almost any recorder or indicator. Standard output is 0-5 millivolts d c. The analyzer can also be supplied with an auxiliary amplifier for current output or with an electropneumatic transducer for air output.

A standard 15⅛- x 12½- x 11-in. housing is supplied with the analyzer, for either flush or surface mounting. An explosion-resistant condulet is also available. Operating controls are conveniently located, and indicating meters mounted on the analyzer panel in the standard case, or mounted alongside the explosion-resistant condulet are optional.



Self-Balancing Scale

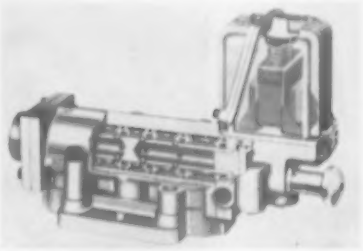
ARTHUR S. LA PINE & CO., 6001 S. Knox Ave., Chicago 29, Ill., has added an automatic self-balancing scale which can be read to 1 gram or 1/100 lb. directly on the indicating dial without balancing loose weights and beam poises. High-speed weighing is provided by an adjustable hydraulic damper which brings the indicator to rest in 2½ oscillations. The dial reads weights to 500 grams or 1.1 lb., and the total capacity of 5000 grams or 11.1 lb. is attained with a poise sliding on a notched beam. The scale is readable in both metric and avoirdupois units for laboratory use and technical dispensing. The sliding weight on the beam can be used as a tare by placing a container on the platform and moving the weight until the indicator returns to zero. Bearings are self-aligning polished agate; there are no springs; the platform is stainless steel; and a chip-proof white enamel finish protects the scale from corrosion. All other metal parts are nickel-plated.



Feeder-Scalper

UNIVERSAL ENGINEERING CORP., Cedar Rapids, Iowa, has brought out the "Wobbler" feeder, designed for heavy-duty quarrying and mining operations. The unit performs feeding and scalping functions in one operation, supplanting in some operations the conventional feeder-screen combination. Patented elliptical bars of manganese steel form the feeder bed and by alternate horizontal and vertical positioning impart a rocking, tumbling motion to materials. This action causes fines to be extruded through the bed to a conveyor belt as the oversize is cleaned of adhering material and fed to trucks or directly to the crusher.

Design features include: spherical self-aligning bronze bearings on the "Wobbler" bars with anti-friction bearings for all drive parts; requirement of no more than 15 hp.; size of scalped product controlled without expensive mechanical changes; and self-contained splash and bath system lubrication. Capacities of up to 2500 t.p.h. may be attained, depending on driven speed, bar spacing, and type of material handled.



Control Valves

C. B. HUNT & SON, INC., Salem, Ohio, has introduced a line of "B"-Type control valves, the valve chambers of which are formed by aluminum spacers held in metal to metal end abutment. This patented arrangement is said to simplify internal construction, permitting the "O" rings or "U" packers to be supported on both the inside and outside diameters without placing mechanical pressure on the packers. The hollow, radially ported, stainless steel, ground and polished plunger is the only moving part except the operating mechanism. The solenoid valves are of pilot operated design, and an override button permits manual operation of the valve during installation or in case of power failure. The valves are available in single and double solenoid, as well as lever and single and double piloted design.

Cable Saver

YUBA MANUFACTURING CO., C & D Division, Perkins, Calif., has announced the incorporation of an automatic cable saver on its line of C & D Movall Rock-Wagons. The cable saver automatically disengages the cable control unit before the dozer-type ejector hits the stop end, thus aiding to prevent cable breakage.

There's no "guess work" and—

The Customer Writes His

at Crystal Lake

Where Sand and Gravel Gradation is

Aerial view of plant near Crystal Lake, Ill. Showing (1) six 1191½-ft. field conveyors and one standby to extend operations; (2) primary crusher and stationary stacker; (3) screen and secondary crusher; (4) main washing and screening plant; (5) sand classification plant; (6) five-bin railroad car loading point

Own Ticket

Pre-Engineered

By GEORGE C. LINDSAY

A SAND AND GRAVEL PLANT where the customer can almost write his own ticket so far as gradation is concerned has been opened this year by Consumers Co. near Crystal Lake, Ill., in McHenry County about 45 miles northwest of Chicago.

In fact, gradation—large scale gradation without guesswork—is the heart of the plant. The operation was practically built around the idea of meeting rigid specifications of customers with a great variety of needs. As a result, it is possible to hit the middle of a gradation curve or to get on one side or the other of it.

To achieve this ability to deliver truly customized sand and gravel in large quantity called for a plant design based, according to C. E. Hogeboom, chief engineer for the company, "on economy of operation and flexibility." In short, the aim was a plant that would provide greatest quantity of salable products at cheapest cost.

It is the flexibility of the plant that makes it possible to supply customers with fully controlled gradation, within limitations, Mr. Hogeboom pointed out.

The Consumers firm was presented with the challenge of building a new highly efficient plant capable of large scale customizing when its former deposit in the area, worked since 1924, became depleted. The new Crystal Lake plant is the company's answer to that challenge.

Processes and equipment in the plant are the result of forethought and pre-engineering attention to detail. Outstanding features include extreme flexibility in operation, specially designed equipment with portability built in, full automatic control, rigid control of product gradation, and integration of processes designed to produce quality products. Those factors are interlocked in operation from pit to railroad car or truck to provide an outstanding example of modern, efficient aggregate production.

The general flow arrangement is included in Fig. 1, the flow diagram. Briefly, plant operation is di-

vided into five main sections, although all of the plant normally will be operated at the same time. (1) Pit and primary crushing section. Raw material is mined by a 3.5- cu. yd. shovel from a deposit that averages 40 ft. in depth on the property. Primary crushing is to minus 2½ in., and crushed raw feed goes by belt conveyor to a surge pile. (2) Secondary crushing and screening section. Feed to this section is pre-screened over twin vibrating screens, and all plus 1-in. size can be reduced to minus 1-in. in a Hydrocone crusher and re-circulated. (3) Sand plant. Sand (minus ⅜-in.) and water are delivered to the sand plant for classification in scalping tanks, cleaning in a double-screw washer, and grinding of pea gravel by rod mill, for improvement of sand gradation, if necessary. (4) Blending section. This is the heart of the plant, where extreme flexibility is available in providing quality products according to customer specifications. (5) Loading out bins. Final coarse products may be loaded into trucks or railroad cars. Sand also is delivered by belt conveyor to designated loading out bins for loading into trucks or railroad cars.

Main plant design was envisaged by Consumers Co., and special design problems were presented to Western-Knapp Engineering Co. for study and solution. Barber-Greene Co. created the new field belt conveyors, which were designed to fit use specifications of the operator. There are many unusual op-

Above: Raw material is fed to the specially designed grizzly-hopper-feeder combination portable unit

Right: Conveyors installed in the pit. Large permanent conveyor, left foreground, accepts material from field conveyors. First field conveyor may be pivoted over lower end of permanent conveyor as pit face advances

erating and engineering design features in this sand and gravel operation. A discussion of those features will indicate the value of forethought and planning in putting together a plant that was described by a toll road engineer as "The best plant I ever have seen."

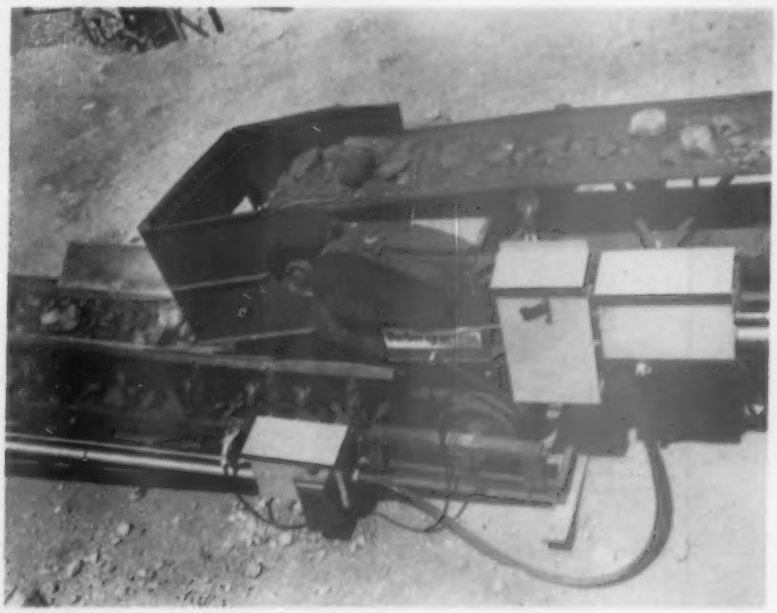
The 10 x 10-ft. field hopper is so designed and constructed as to provide portability as the main feature. The unit weighs 9 tons, is mounted on skids, and provides 10 cu. yd. of field storage — roughly three shovel dipper loads. The hopper assembly is equipped with a 42-in. belt-type feeder, which feeds pit run material on the belt line at a continuous rate. The problem in design of this hopper was to provide a rated capacity feed of 750 t.p.h., to keep hopper height down to shovel operating limitations, and to limit total weight to that which could be handled by the loading shovel in making hopper moves. The feeder has a plug-in type electrical connection and 60 ft. of cable, so that need to make electrical-connection moves is reduced.

A field conveyor system was selected by management as the type that would give greatest flexibility in use and lowest operating cost. "We think belt conveyors are a relatively low-cost form of transportation", said Mr. Hogeboom. After making the decision to use belt conveyors, the problem was to design a conveyor unit of the longest possible length with a weight limit that could be handled by the loading shovel. Management believed that, with the amount of moving that was necessary in the mining set-up and with the amount of material that had to be moved, it would be unwise to "fool around with skid-type conveyors."

The problem of design was given to Barber-Greene Co., which produced the seven portable units now in use at Crystal Lake. Each unit is 119½ ft. long, is constructed with a special 24-in. truss, and has only two points of suspension. Total weight of each unit is 9 tons, or about 150 lb. per lin. ft. Each is an operating unit in itself, and is provided with two angle-iron bales that, with special beam and cables, are used for moving. The seven units in use provide haulage service for a total distance of 800 ft. in the pit.

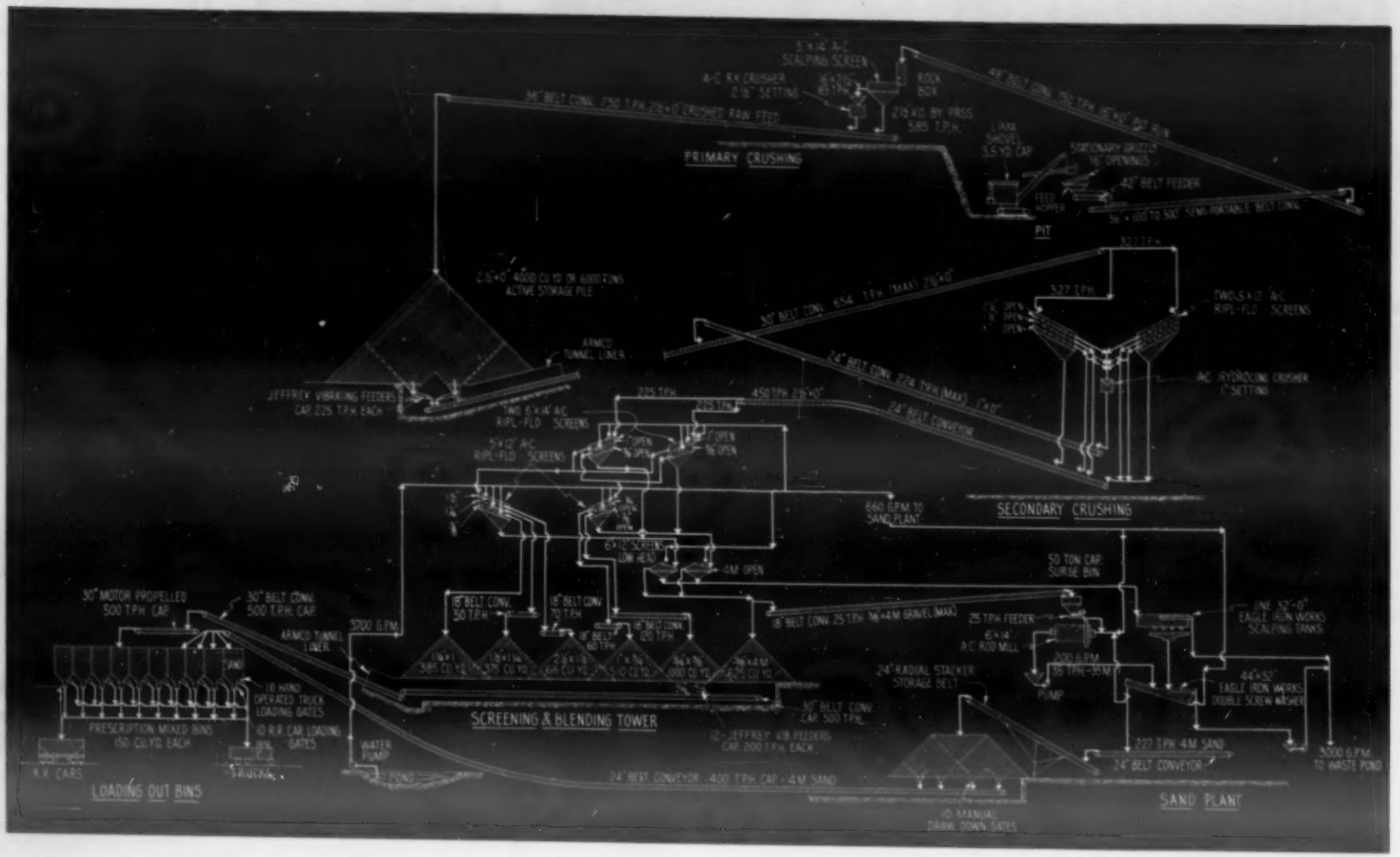
At first, the conveyors were set on the surface and a dragline was used for loading. Recently, the units have been moved into the pit and loading now is by 3.5-cu. yd. shovel.

Provision for an active storage pile in the plant



Field conveyors were specifically designed for use at Crystal Lake. Each is 119½ ft. long, constructed with 24-in. truss, has only two points of suspension, and is an operating unit in itself

Flow diagram of Crystal Lake plant


PRIMARY CRUSHING
PIT
SECONDARY CRUSHING
SCREENING & BLENDING TOWER
LOADING OUT BINS
SAND PLANT
PRESCRIPTION MIXED BINS
50 CU YD EACH
10 HAND OPERATED TRUCK LOADING GATES
10 R.R. CAR LOADING GATES
R.R. CARS
TRUCKS
WATER POOL
WATER PUMP
ARMCO TUNNEL LINER
JEFFREY VIBRATING FEEDERS CAP. 225 T.P.H. EACH
TWO 6'X14' A-C RIPL-FLO SCREENS
5'X12' A-C RIPL-FLO SCREENS
6'X16' SCREEN LOW HEAD
50 TON CAP. SURGE BIN
30" MOTOR PROPELLED 500 T.P.H. CAP.
30" BELT CONV. 500 T.P.H. CAP.
18" BELT CONV. 50 T.P.H.
18" BELT CONV. 70 T.P.H.
18" BELT CONV. 120 T.P.H.
18" BELT CONV. 25 T.P.H. 36+4M GRAVEL MAX.
25 T.P.H. FEEDER
6'X14' A-C ROD MILL
200 G.P.M. 35 T.P.H. 3/4M PUMP
24" RADIAL STACKER STORAGE BELT
30" BELT CONV. CAP. 500 T.P.H.
12 - JEFFREY V/B FEEDERS CAP. 200 T.P.H. EACH
24" BELT CONVEYOR 400 T.P.H. CAP. - 4M SAND
10 MANUAL DRAW DOWN GATES
227 T.P.H. 4M SAND
24" BELT CONVEYOR
ONE 42'-0" EAGLE IRON WORKS SCALPING TANKS
44"x32" EAGLE IRON WORKS DOUBLE SCREW WASHER
5000 G.P.M. TO WASTE POND
3700 G.P.M.
660 G.P.M. TO SAND PLANT
5'X14' A-C SCALPING SCREEN
A-C RK CRUSHER 21" SETTING
ROCK BOX
21"X10' BY PASS 585 T.P.H.
36" BELT CONV. 750 T.P.H. 21"X10' CRUSHER RUN FEED
LIMA SHOVEL 3.5 YD CAP
STATIONARY GRIZZLY 6" OPENINGS
42" BELT FEEDER
FEED HOPPER
PIT
2 @ 40' 4000 CU YD OR 6000 TONS ACTIVE STORAGE PILE
30" BELT CONV. 654 T.P.H. (MAX) 216'-0"
322 T.P.H.
TWO 5'X12' A-C RIPL-FLO SCREENS
24" BELT CONV. 274 T.P.H. (MAX) 174'-0"
A-C HYDROCONE CRUSHER 1" SETTING
225 T.P.H.
450 T.P.H. 216'-0"
24" BELT CONVEYOR

layout gives several advantages. Space is available for storing 4000 cu. yd. or 6000 gross tons of crushed 2½-in. x 0 raw material. It allows the mining operation to work a 6-hr. day and the plant to work 10 hours. Rated capacity of mining and primary crushing is 750 t.p.h.; plant rated capacity is 450 t.p.h. Storage sets apart the pit and primary crushing plant from the rest of the plant operation, so that down time on either side does not affect operation on the other. Resulting flexibility acts to reduce operating cost.

A concrete pillbox under the live raw-storage pile is fitted with two draw-down points. Each is supplied with a 225-t.p.h. vibrating feeder that supplies crushed raw feed to the secondary crushing and screening section. The storage pile with feeders gives the advantage of a controlled and even feed, which gives better operation in the screening plant.

Design of the secondary crushing section gives flexibility to the operation. If desired, all material received or any screened part of it can be passed through the crusher. Advantage of this arrangement is that it relieves the need to change screens in the screening plant to provide the sizes wanted, with a resulting decrease in labor cost.

Feeders under the storage pile are controlled for capacity in the secondary crushing plant. Normally, speed of feed is indirectly proportional to the amount of large size in the feed that is above average for which the plant was designed. To date, however, the operation has balanced out at a 520-t.p.h. feed, based on a rated capacity of 450 t.p.h.

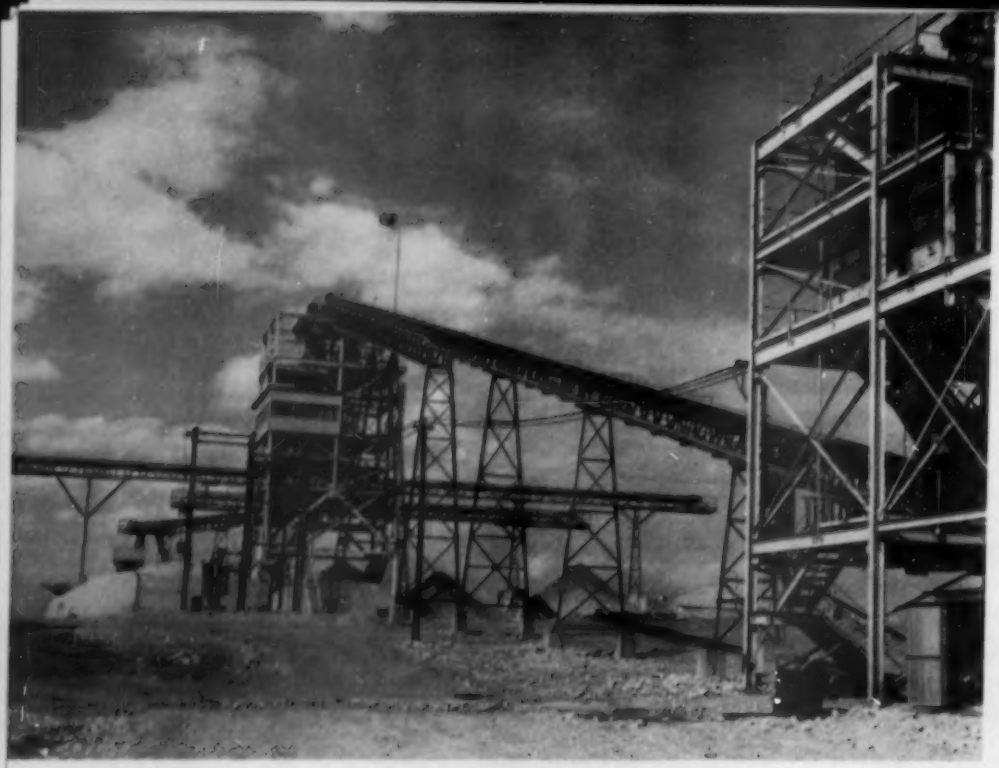
The main screening plant is set to give flexibility in operation and accurate control of gradation of quality products. All material is washed not less than twice by jets of water at 80 p.s.i. at the feed to the first sets of screens and by at least two sprays on each deck of each screen. Water is jetted onto the feed at 1100 g.p.m. Material processed easily passes the rigid specifications for silts and fines.

Two primary and four secondary vibrating screens allow the preparation of six major sizes of aggregates, plus sand. Most of the sand products (minus ⅜-in.) is separated on the primary sizing screens. It is re-screened at 4-mesh, the through product being sent to a 32-ft. scalping tank.

Detailed thought was given to providing accurate sizing facilities to fit the plant capacity. Additional features that are practical from an operating standpoint are built in. (1) When all material is reduced to minus 1-in. size in the secondary crushing plant, the material handling conveyors for plus 1-in. size in the main screening section are stopped. Power saving is the result. (2) Also, when crushing to minus 1-in., two additional storage piles for sized aggregates (2½ x 1½-in., 1½ x 1¼-in.) may be used for small sizes (1 x ¾-in., ¾ x ⅜-in.). This

Live storage pile reclaim tunnel, steel lined, is is equipped with two vibrating feeders that deliver 450 tons of material per hour to the secondary crushing section of main plant

Secondary crushing section receives minus 2½-in. size from the surge storage pile over conveyor in reclaim tunnel (right background)

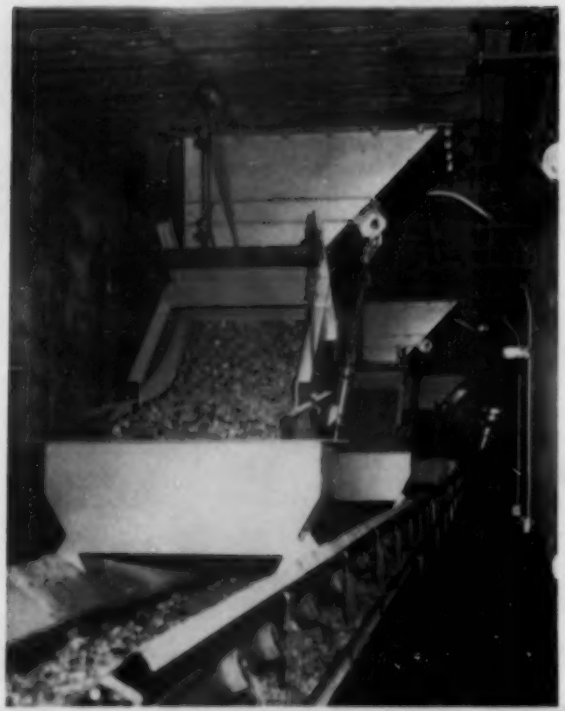


Main screening section receives 2½-in. x 0 crushed material over conveyor at right

plan gives four draw-down points over the collecting conveyor for small sizes and increases capacity for handling and blending finer material. (3) Pea gravel may by-pass the storage pile for delivery to a rod mill where it is reduced to sand size.

The sand plant is designed to clean and grade a ⅜-in. x 150-mesh concrete sand. Major features built in are (1) ability to clean and classify 50 percent of pit product as sand, (2) the rod mill with 50-ton surge bin that can grind to 325 mesh (normally grind to 50 mesh), and (3) a radial stacker for live and ground storage of sand. The rod mill was designed into the plant to take care of a natural shortage of fines in the deposit. It may be left out of the operating control circuit, however, when there is no need for its use. Storage space for sand is provided for adequately. The radial stacker may discharge onto a live storage pile for a reclaim tunnel, but also may move sand to ground storage.

Customized products may be blended accurately in the reclaim tunnel underlying the six live storage piles



The type of blending facilities at Crystal Lake plant is not new, but the size of the operation and the ability to make "custom" products is novel. The reclaim tunnel under the 6-pile live storage of graded products is supplied with 12 vibrating feeders—two under each surface pile location. Capacity of each feeder is rated at 200 t.p.h.

Each feeder can be controlled at preset and calibrated speeds on a tonnage basis so that any of a great number of combinations of blends may be

(Continued on page 120)

Perlite Comes of Age

Here's how perlite—particles of perlite sands expanded 11 times in volume—has been accepted in the construction industry. Atlantic Perlite Company's plant in Washington, D. C. is a typical operation.

TEN YEARS AGO the commercial use of expanded perlite was almost zero. Today that industry is the boy wonder of the lightweight aggregates.

As recently as 1948 total use of perlite plaster was a mere 10 million square yards. Just seven years later, in 1955, output had leaped to 126 million square yards—a growth of 1100 percent.

Expanded perlite, when substituted for sand in plaster or concrete, offers advantages of light weight, fire protection and insulation. These qualities have been put to work in the past few years in building all types of structures from skyscrapers to homes. The result has been an ability to reduce the amount of heavy steel framework required, and thus materials cost. At the same time, building weight per square foot of ground area has been decreased, but adequate strength and protection against fire have been maintained.

Six years ago, realizing the growing potential for the use of lightweight aggregates in plaster and concrete for building construction, the Atlantic Perlite Company was organized in Washington, D. C. The company's manager, Jesse L. Maury, has been an operating and consulting engineer for many years. His interest in lightweight aggregates, particularly perlite, dates back to the early 1940's.

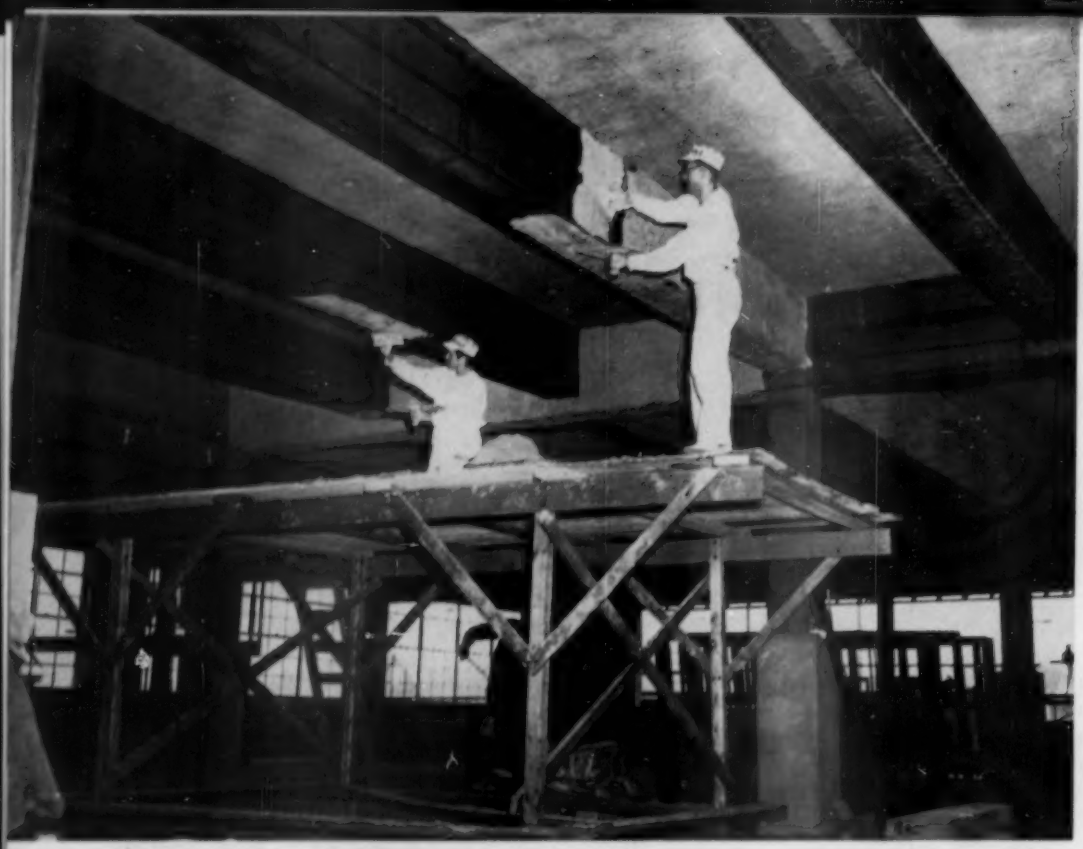
Perlite is the name given to both the raw ore and the expanded light weight product. In its raw state it is a volcanic glass found in Tertiary rocks in the Rocky Mountain area of the U. S. It also is being mined in Iceland, Sardinia and Italy. Chemical composition of the ore varies, but generally it is an aluminum silicate containing small amounts of other compounds. Silica content of the ore used by Atlantic Perlite Company ranges from 66 to 72 percent; aluminum content is from 10 to 15 percent. It contains 3 or 4 percent occluded water.

Perlite ore is mined in Colorado, New Mexico, Arizona, Nevada and California by surface mining methods. It is ground and sized at the mines and normally is shipped as a graded sand. Ore received at Atlantic Perlite's plant weighs about 90 pounds per cubic foot; it is received in covered 60-ton hopper railroad cars at the expanding plant near Washington, D. C.

Perlite sand, when subjected to high temperatures quickly expands or "pops" readily to 11 times its original volume. Research shows that the inherent moisture in the ore is rapidly changed by high heat into steam. The steam explodes the perlite ore particles into greatly increased masses of light weight material that, when chilled, has a cellular structure with sealed pores. Actually, the steam blows glass bubbles that form the expanded mass. The process is not unlike that of "popping" popcorn. The expanded perlite product is a white, rough vesicular, granular aggregate that may vary in weight, according to the degree of expansion, from less than 3 to more than 15 pounds per cubic foot.

Expanded perlite is a good non-conductor of heat, or insulator. It is fire-proof and light in weight. Since World War II, the use potential of the material in the building industry has just begun to be realized. The lightweight aggregate, when substituted for sand in plaster, provides a material that is making headway in the plaster industry. Perlite plaster weighs only one-third as much as sand plaster. The rate of growing acceptance of the material is shown by the fact that perlite plaster consumption has increased from 45.9 million square yards in 1950 to 126 million square yards in 1955. Perlite concrete is a relatively light weight material that is used where applicable to save weight of steel in buildings. The insulating quality of perlite concrete is 12 times that of sand and gravel concrete.

Because of its light weight and good fireproofing qualities, amount of perlite plaster required for protecting steel framework of a building is relative-



Lightweight plaster fireproofing for structural steel has been a boon to the plastering industry and encouraged rapid acceptance of perlite aggregate. By wrapping beams with a thin membrane of perlite-gypsum plaster on metal lath, an excellent fire rating is obtained with a minimum weight

ly small. Its use has been found to cut by 15 to 20 percent the amount of structural steel required in a building. The new 30-story Alcoa Building in Pittsburgh, Penn., is an example of weight and cost savings that can be made with the use of light metals, perlite plaster and concrete in the building industry. It is the lightest building of its size ever constructed. Weight of exterior walls is 40 pounds per square foot; conventional walls weigh 150 pounds per square foot. Outside walls of a typical office building have a 4-inch facing and an 8-inch backup wall. In the Alcoa Building, a 4-inch perlite backup wall gives the same insulation and enough strength. Experience with other buildings tells the same story. In Cleveland, Ohio, builders of a 100-unit 12-story apartment building saved 45 tons of steel by use of perlite plaster on ceilings and for column fire protection. Cash saving is believed to be $8,000. The Fontainbleau Hotel in Miami Beach, Fla. and the United Nations Building in New York City are other examples of modern construction that utilize the advantages of perlite expanded aggregate in building materials.

From a competitive viewpoint, perlite concrete does not enter the high strength market served by concrete made with sand and normal aggregates. Specifications that call for concrete strengths in the 2000- to 4000-p.s.i. range rule out the use of perlite concrete. However, lightweight concrete made with perlite aggregate can be used effectively in places where lightweight, fire resistance and insulation qualities are advantageous. It is particularly adapted for use as roof and floor fill, for radiant sub-floor slabs, fireproofing, and partition or wall masonry units. Usual strength of perlite concrete for roofing purposes is 150 to 200 p.s.i. At the higher figure, compressive load per square foot is 14.4 tons, which is more than adequate for such application.

Other uses include filling of ship bilges with perlite concrete, lining refrigerators and refrigerator railroad cars with the expanded aggregate, and soundproofing radio stations. Perlite is added to rubber-base paints as a flattening element and extender. Automotive and air-conditioning filters containing perlite have been most effective. It has replaced fibers as packing material in some cases. In that connection the Washington company supplies expanded perlite to a local biological house that manufactures polio vaccine. It is used as an effective packing and insulating material, since the vaccine must be transported under specific temperature conditions.

Because of the high degree of competition in the perlite expanding industry, manufacturing methods and particularly product specifications for extreme fines normally are not divulged. Daily output figures of Atlantic Perlite Company's plant are not available, but the plant is considered the largest of its type in eastern U. S. Transportation rates usually limit the area of competition to a 250-mile radius around an expanding plant.

Materials handling and manufacturing facilities at the Washington, D. C. plant are simple but effective. The plant was designed by J. H. Bradford of the Perlite Engineering Corp., Las Vegas, Nev. A vertical furnace is used as the expanding or "popping" unit, and all expanded material is handled and collected by an air classification system.

Raw perlite sand is unloaded from

railroad cars shipped via the Pennsylvania Railroad by a portable Barber-Greene belt-type car unloader. It is delivered to a 25-t.p.h. belt-type bucket elevator that discharges at a height of 45 feet into two round, steel storage silos. Each silo is divided into two compartments, to accommodate different grades of raw perlite sand. Various grades are used to produce varied products, as desired. Storage capacity of the silos is five railroad car loads, or 300 tons.

Each silo compartment is equipped with a pipe outlet at its bottom, through which raw feed may be delivered to the bottom of the bucket elevator and thence to the plant. Plant feed is by gravity from the top of the elevator, through 8-inch diameter steel pipe. Feed to the plant may be split. It can be discharged into a 12-ton surge bin ahead of the vertical expander furnace or, when desired, it can be sent to a 16-ft. long 20-in. diameter rotary kiln preheater. The kiln is insulated with 3½-in. Chemox 1,800 degree refractory blocks, and is fired by a Maxon No. 4 gas burner operating at four pounds gas pressure.

The preheater is set on a slope of 1:11½ to provide a 3½-min. retention time for material in the kiln. This time factor is important, because maximum preheating temperature must be kept below 800 F. Thermocouples installed at the discharge end of the kiln serve the operator in keeping temperature of the preheated product between 400 and 800 F. The kiln is rotated at 5 r.p.m. by a 1½-hp. motor connected through a gearmotor and chain drive to the kiln drive ring.

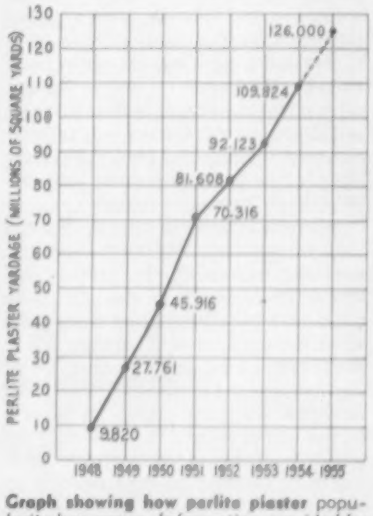
About 40 percent of material processed in this plant is routed through the preheater. Preheating is important in processing some perlite sands, for some are brittle in nature. Because of high molecular strains in brittle sands, they shatter when subjected to thermal shock such as they receive in the expander furnace. Shattering produces an excess of fine materials, which are not desirable in the expanding process. The process of preheating in the rotary kiln relieves the molecular strains in brittle perlite sands. It tends to reduce the amount of fines produced by explosion of particles in the expander furnace.

The important process of popping or expanding perlite sands is done in a vertical, stationary-type expander furnace, designed by J. H. Bradford and built by O. J. Scherer Co. under license by Combined Metal Reduction Co. The furnace has a 2-ft. diameter and stands 24 ft. high. It is fully jacketed. Raw perlite sands or preheated sands from the kiln are introduced near the bottom of the expander furnace but above the venturi throat where maximum furnace temperature of 1600 F. is reached. The furnace is fired by eight gas burners that are set to form a plenum at the venturi throat. As perlite sands drop to the furnace throat, immediate expansion or popping takes place. Volume of material is increased about 11 times in the process.

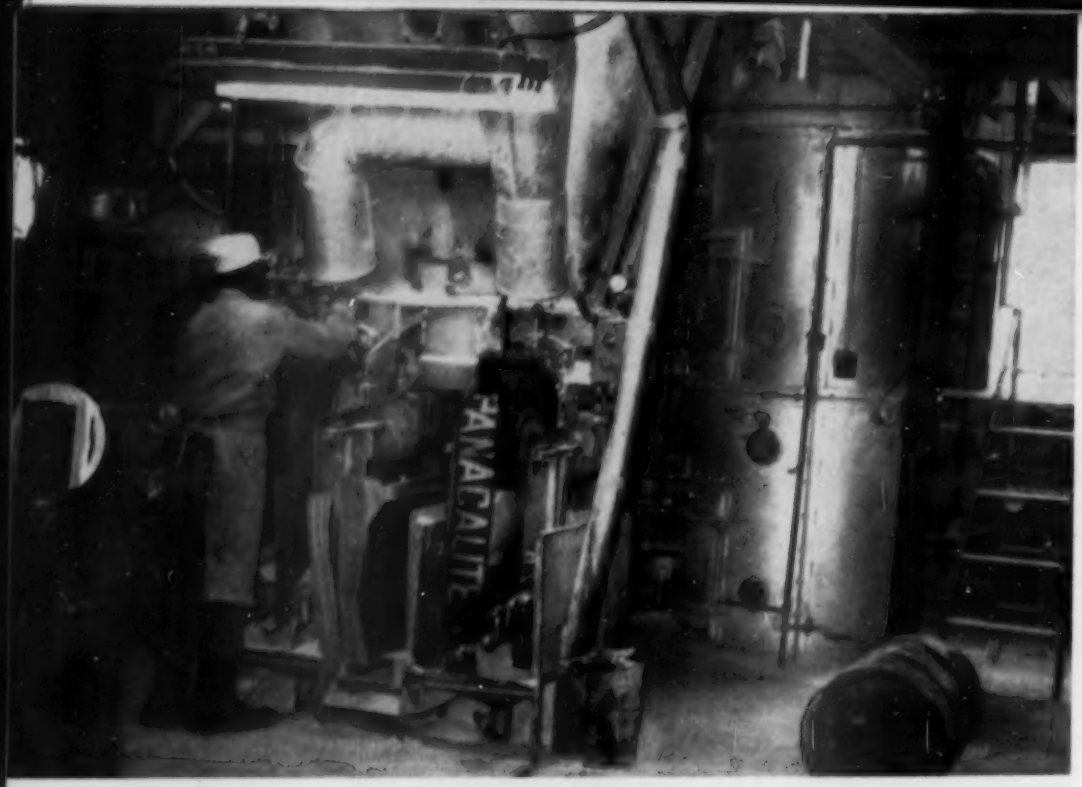
Much attention is paid to operating conditions of the furnace, inasmuch as different ore sands require different temperatures for proper expansion of particles. The furnace is equipped with thermocouples and recording meters to indicate temperatures at the bottom and top of the furnace. Other instruments record draft and combustion conditions.

An air classification system is used at the Washington plant. Expanded perlite particles rise immediately in the expander furnace after they have been popped. They are borne by air currents in a combination vacuum-pressure air classification system that is used to separate grades of product. The air system services the furnace, a 30- x 10-ft. primary cyclone, a 9-tube Western Precipitation multiclone, and a 20- x 5-ft. Buell secondary cyclone separator. The air classifying system operates exhausting up to a

Perlite plaster or insulating concrete can be sprayed on walls and ceilings or applied by conventional hand methods. After spraying, the wall is leveled and trowelled smooth



Graph showing how perlite plaster popularity has grown. Information provided by Perlite Institute, based on data from U.S. Bureau of Mines



Compact production area. Expander furnace in right background "pops" perlite, which is collected in primary cyclone (top center). Automatic bagging machines load from bottom of cyclone

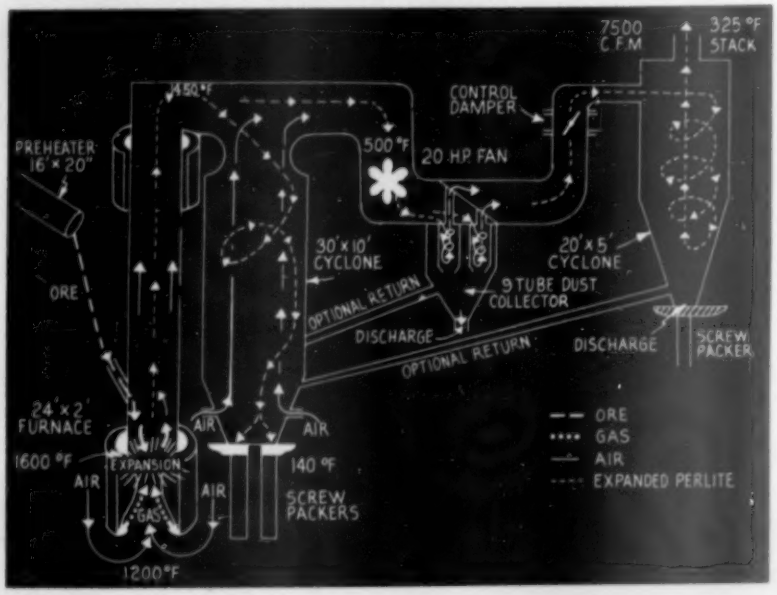
point between the primary cyclone and the multiclone, then becomes a forced-air system. Air at 7,500 cubic feet per minute is circulated by a fan that is driven by a 20-hp. motor.

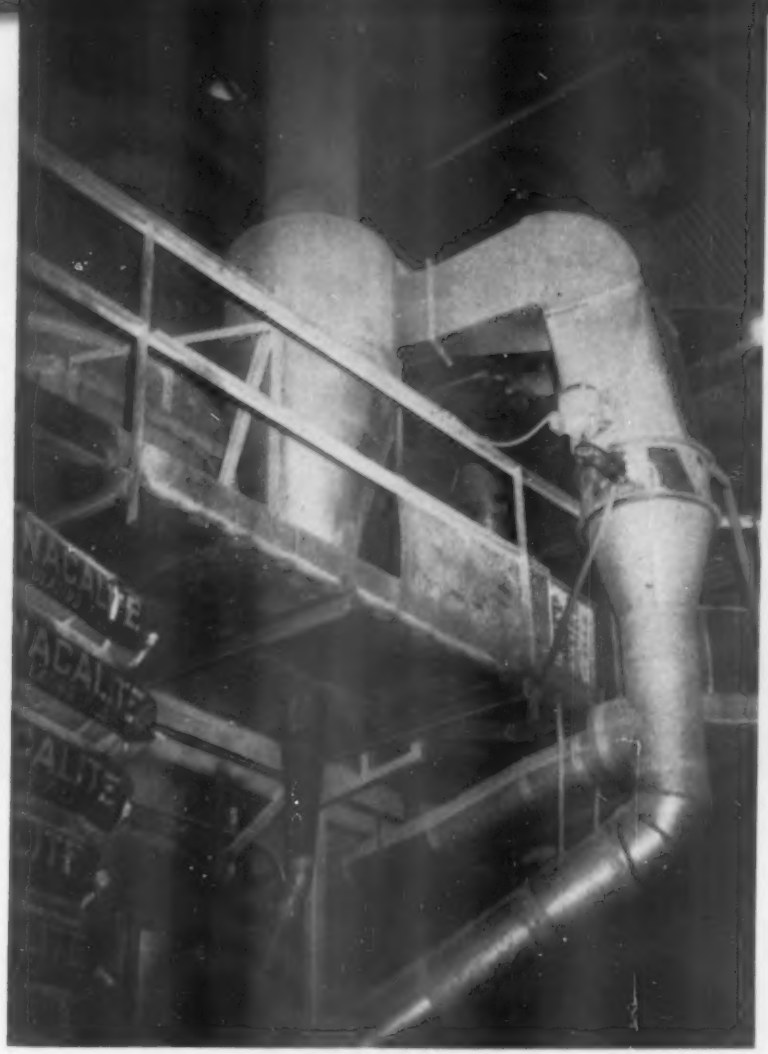
The air-system fan pulls down air from the top of the expander furnace between the furnace core and the jacket. As it moves downward toward the firing chamber, air is preheated by the furnace to about 1200 F. Temperature at the venturi throat near the bottom of the furnace, where perlite expansion takes place, is 1500 to 1800 F. Normal operating temperature is 1600 F. Air suction created by the fan carries the expanded perlite particles to the top of the furnace where temperature is reduced to 1450 F. Particles then follow the air current into the 30 x 10-ft. primary cyclone.

Air also enters the system through a 3/8-in. air ring, 23 ft. in diameter, near the bottom of the primary cyclone. The upward air currents cause the perlite particles to cool from 1450 F. at the top to 140 F. as they fall to the bottom of the cyclone. Also, the air current operates to classify the material collected, carrying about 20 percent of the lighter weight material over the top of the primary cyclone. The floating particles then pass the fan and go by forced air current to the 9-tube Multiclone in which fines are collected. Air temperature at the fan is 500 F. The fines, which represent 75 percent of the material passing to the multiclone, are collected and returned to the primary cyclone for loading or bagging. They may be collected separately, as desired.

Extreme fine particles that are carried over the Multiclone by the air classifying system (25 percent of feed to the Multiclone) enter the secondary cyclone separator. These fines consist of some of the smaller expanded particles and most of the splinters spalled off the surfaces of larger particles dur-

Flowsheet of plant for the production of expanded perlite





Good housekeeping is aided by the auxiliary cyclone (left) which collects perlite dust from above and below bagging stations while portable vacuum is used to keep working area clean

ing the expansion process. When collected, they form a porous, fluffy mass that has a bulk density of 8 to 9 lb. per cu. ft. This product is a specialty product. One 4-cu.ft. bag is produced and collected for every 20 bags of plaster or concrete aggregates. It has been used successfully as filtering material, and many new uses for it are being studied. Fines from the secondary cyclone also may be returned to the primary cyclone, or they may be bagged as desired.

The air classifying system operates in a closed circuit as far as material collection is concerned. A stack exhaust above the secondary cyclone emits to the atmosphere a volume of material that equals about five percent of plant feed, but the stack loss is primarily moisture. Temperature of the air at the exhaust stack is 325 F. so that there is a 1,275-F temperature reduction in the system between the furnace throat and the exhaust stack.

There are three possible collection points for expanded perlite in the plant, but the one under the primary cyclone is used principally. Material collected in the multiclone is returned to the primary cyclone, as is that from the secondary cyclone when extreme fines are not being bagged. Primary and secondary cyclones are equipped with automatic bagging machines. Two bags can be loaded simultaneously at the primary cyclone bagging station; bags are loaded singly at the secondary cyclone station. Each bagging point has dust collection heads over each bagging position. Collected dust is separated and collected in a separate cyclone used for that purpose.

St. Regis bagging machines include a screw feed from the cyclone to the bag loading point. Bags are positioned on the machine by hand, but the screw automatically stops when a full bag is removed. Expanded perlite is loaded into multiwall paper bags that contain 30 lb. or 4 cu. ft. each. These may be perlite plaster or perlite concrete products. Fines are bagged as Filter-Aid.

Seventy-five percent of the expanded perlite products made by the perlite industry are lightweight aggregates for the plaster industry. An additional

TABLE 1: SPECIFICATIONS FOR GRADING PERLITE AGGREGATE*

A — PERLITE PLASTER

Retained on Sieve	Percentage Retained by Volume Max.	Min.
No. 4 (4760-mieron)	0	
No. 8 (2380-mieron)	5	0
No. 16 (1190-mieron)	45	10
No. 30 (590-mieron)	85	45
No. 50 (297-mieron)	95	75
No. 100 (149-mieron)	100	88

B — PERLITE INSULATING CONCRETE

Passing Sieve	Percentage Retained by Weight Max.	Min.
No. 4 (4760-mieron	0	
No. 8 (2380-mieron)	15	0
No. 16 (1190-mieron)	60	15
No. 30 (590-mieron)	80	40
No. 50 (297-mieron)	95	75
No. 100 (149-mieron)	100	90

*-A.S.T.M.

20 percent is marketed as aggregate for lightweight concrete. The remaining 5 percent of production includes extreme fines for Filter-Aid, insulating fill, agricultural perlite, and additives for texture paints. Plaster and concrete aggregates are manufactured in strict compliance with specifications established for the industry. Specifications for other products produced are manufacturing secrets. They are not divulged, since keen competition is being experienced in specialty fields that are growing in number rapidly.

Each bag of expanded perlite is weighed and sealed after loading, then is stacked near the bagging station on 60 x 40-in. pallets. A 1-ton gasoline operated Clark fork truck moves the 20-bag pallets to storage in a 10,000-bag warehouse adjacent to the plant. All shipments of the bagged products are made by truck.

Offices and plant of the Atlantic Perlite Company are at 1919 Kenilworth Ave., N. E., Washington, D. C. Jesse L. Maury is manager, James D. O'Brien is sales manager, and C. D. Ruffner is office and traffic manager.

Perlite producers think the future holds additional opportunities for increased use of expanded perlite, particularly in the better designed buildings and homes where advantages of insulating, fireproofing and light weight factors can be utilized.

Arab Potash Plant

A $12,300,000 POTASH PROJECT, to be located at the north end of the Dead Sea in Jordan, will be financed by Egypt, Iraq, Lebanon and Saudi Arabia. Shares will be offered for public subscription in the Arab countries.

Quarry action scene showing 18-cu. yd. scraper, three wagon drills, three 2½-cu. yd. shovels, and end dump trucks. Pile in background is spoils bank

Producing 1,500,000 Tons for Kansas Turnpike

AROUND THE CLOCK

. . . operation of the Concrete Materials and Construction Co., crushed stone plant at Eskridge, Kans., to supply road base material to meet September Turnpike completion dead-line. Capacity of plant is 1000 t.p.h.

By KENNETH A. GUTSCHICK

PRODUCTION OF 1,500,000 TONS OF ROAD BASE STONE in six months—that's the goal for the new Eskridge, Kans., limestone quarrying operation of Concrete Materials and Construction Co., Cedar Rapids, Iowa. Located about 40 miles southwest of Topeka (5 miles south of Eskridge), the quarry is supplying minus 1½-in. base and sub-base material at a 12,000 ton per day clip for construction of a 25-mile section* of the Kansas Turnpike south of Topeka. The operation was started March 15, and the contract is to be completed in September, with the Turnpike scheduled for opening in October.

To accomplish this herculean task, Concrete Materials erected a rugged-build 1000 t.p.h. crushed stone plant, which it has been operating on an around-the-clock, six days per week basis. On the quarry side, there are in service three wagon drills, four diesel shovels, and nine end dump haulage units, working a 16 to 18 ft. limestone formation. Stone-plant facilities include a 5360 double-impeller impact breaker—the largest of its type—as the primary crusher, a battery of four 4033 hammermills used for final reduction, and four triple-deck vibrating screens, each operated in closed circuit with a hammermill. These units are so arranged that if one screen (or mill) is down for repair, the other three pairs can maintain high output. All plant units, including the interconnecting belt conveyors and feeders, are operated either directly by diesel engines or through diesel-electric generating sets.

Another plant feature is the use of a 180-deg. boom-type radial stacker

*The Turnpike from Topeka south to the Oklahoma state line will have an asphaltic concrete wearing surface, whereas portland cement concrete will be used on the Topeka-Kansas City section.

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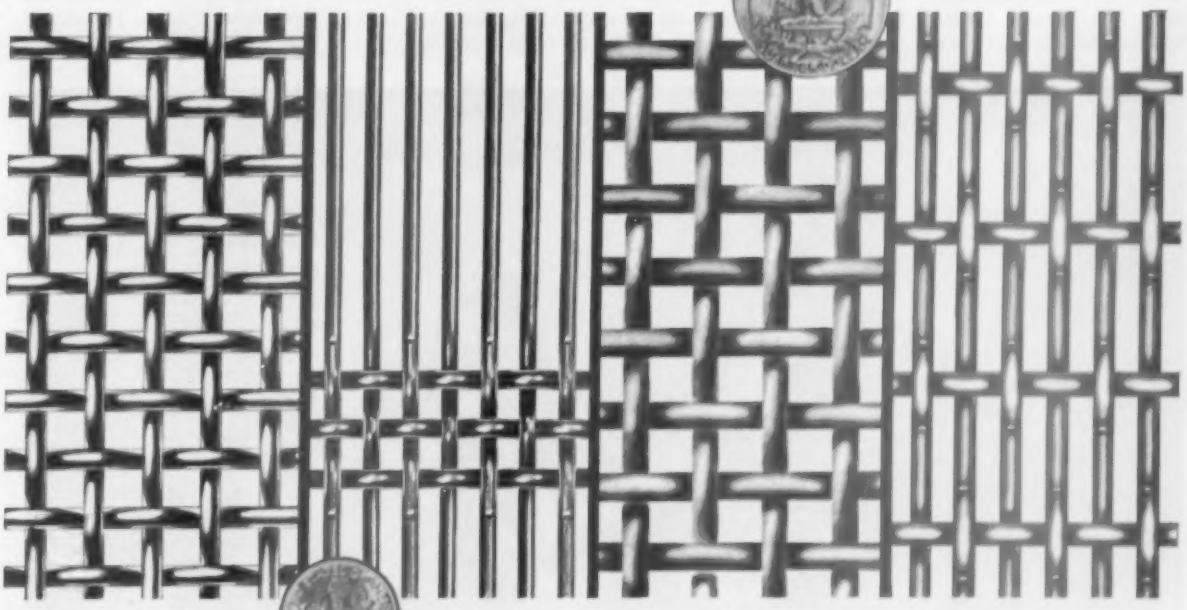

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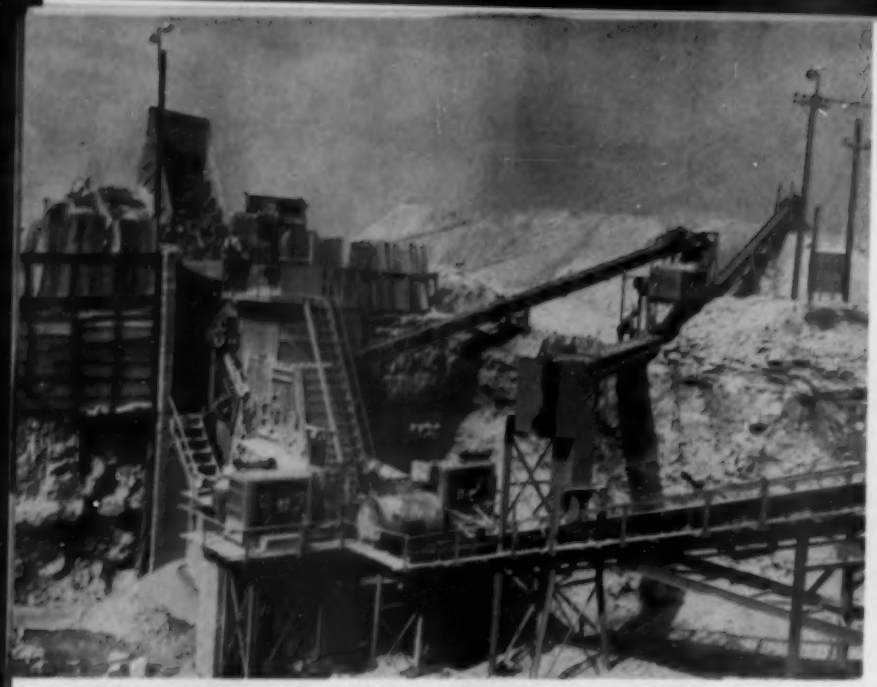


Primary crushing station, including double-impeller impact breaker driven by two 200 hp. diesel engines. Scalping screen in background rejects fines to waste conveyor and returns oversize to the circuit

for delivering the finished product to a 35,000 ton capacity stockpile, from which the material is reclaimed by three tunnel belt conveyors for direct truck loading. This loading system, coupled with the use of two 30-ton truck scales, permits deliveries by the 70-odd truck fleet to be made at a 1000 t.p.h. rate.

The plant was designed to meet stringent specifications for both plasticity index and gradation. The maximum P.I. allowed for both the base and subbase material is only 5.0 (this compares to 8.0 for the state); and the liquid limit must not exceed 30. Specifications for size gradation are as follows:

Passing Sieve	Base Percentage	Sub-Base Percentage
2 in.	100	100
1½	100-70	100-75
1	100-60	100-60
½	—	95-45
⅜	95-39	—
4-mesh	75-25	80-25
10	55-17	65-17
40	30- 8	40- 8
200	12- 0	12- 0

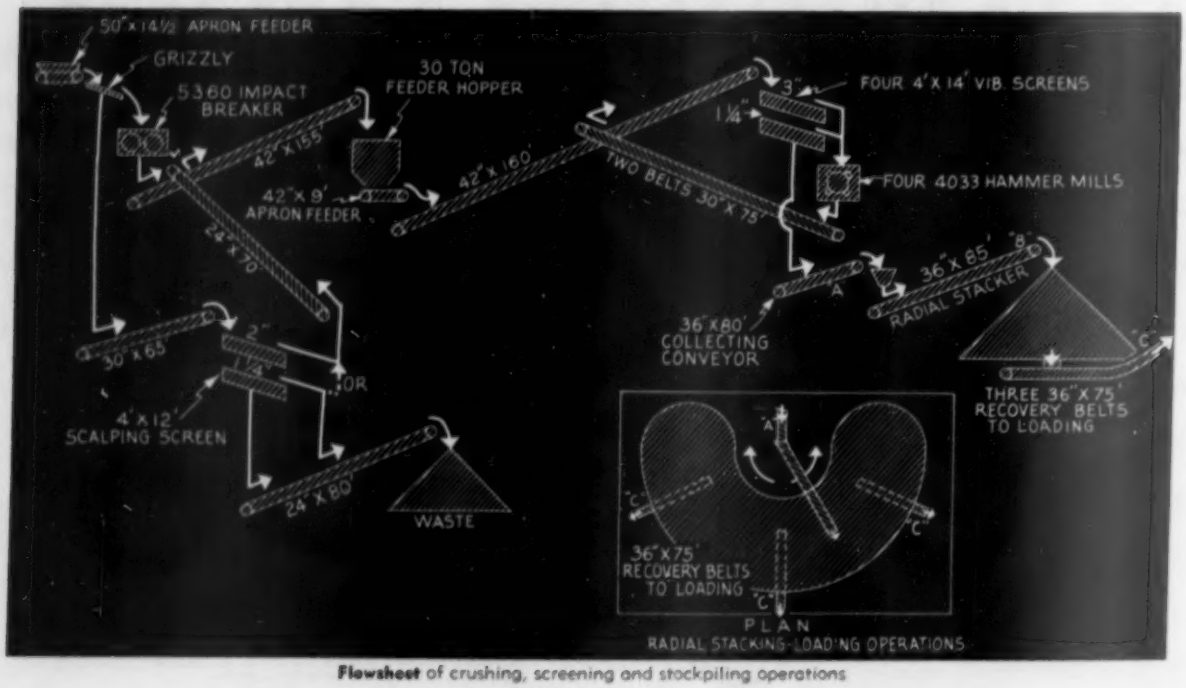
The Kansas Turnpike Commission maintains an extensive testing laboratory at the quarry site, and samples are taken with a special sampling device every 300 tons of production (or less if desired). Besides determining the gradation and P.I. of each sample, the laboratory staff also calculates the moisture content, since all loads are ticketed on the dry basis.

The quarry face contains up to 7 percent clay, occurring along joints, often in pockets. In order to remove the bulk of this material, the plant uses a grizzly ahead of the primary breaker, which bypasses minus 4-in. material to a double-deck scalping screen. This unit returns the oversize to the circuit, the fines being wasted. In addition, a picker is used to remove the oversize clay lumps from the return belt.

To minimize segregation in stockpiling the company-designed radial stacker discharges at a height less than 15 ft., according to state highway department requirements. A special loading chute was also designed to prevent segregation during truck loading; these units will be described later.

The quarry site was determined after six months of careful investigation carried on along the entire Turnpike route by the company. The exploration program included extensive core drilling. The Eskridge site was considered the best one available, being located 10 miles from the Turnpike.

The quarry is developed in the Neva limestone formation, of early Permian age (Wolfcamp series). Overburden, consisting of soil and cap rock, varies from 2 to 12 ft. Initially it was removed with shovel and trucks,



Flowsheet of crushing, screening and stockpiling operations

DART 20S-UG 20-ton end dump shuttle truck. Note driver's swivel seat and dual controls for forward or reverse travel. In reverse, driver sights through porthole in canopy.

OIL from ROCKS VIA 4 DART TRUCKS

For use in its experimental shale oil plant at Rifle, Colorado, the U. S. Bureau of Mines recently put to work four custom-built DART Trucks. The shale mines are underground and the trucks are specially designed to negotiate sharp corners and close quarters. The trucks are driven into the mine backwards and after loading, driven out in forward gear. Then there's a long road-haul to the processing plant. Unusual performance is required. The trucks are powered by 225 HP Diesel engines with Twin-Disc Torque Converters and Fuller 4-speed transmissions. The rock-type body, with removable cab protector, has a capacity of 15 cubic yards.

172,400 pounds of DART Trucks lined up to carry more than 80 tons of oil-bearing shale. With a wheelbase of 126", the trucks turn in a radius of 28'.

Ease of handling the big trucks is a boon to the operators. Hydraulic steering, air brakes and dual controls for shuttling eases the job, adds safety.

Up goes 20 tons! Twin 7½" diameter double acting, two-stage Hydreco hydraulic hoists provide fast and positive dumping.

DART TONNAGE ENGINEERED TRUCKS

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SUBSIDIARY OF THE CARLISLE CORPORATION

View of plant showing 42-in. primary conveyor, 30-ton surge feeder bin, secondary 42-in. conveyor, with screening tower and stockpiles in the background

but presently two Caterpillar D8 tractor-18-cu. yd. scraper teams are in service; the material is dumped into the worked out section of the quarry.

Primary drilling is handled by three Gardner-Denver wagon drills of latest design, which are supplied air from two portable Gardner-Denver 600 c.f.m. air compressors (one rotary and one piston-type). Screw-on-type sectional steel is used, which speeds up drilling by eliminating drill rod changing. The drilling rate, using 3½-in. Timken tungsten carbide insert bits, averages over 50 f.p.h.; generally one drill places 40 16-ft. holes in a 12-hr. shift.

An 8- x 16-ft. or 7½- x 15-ft. drilling pattern is used, with six rows comprising each shot. An average shot consists of 75-100 holes. Atlas explosives are used, with Geladyn 1 at the base, followed by Amodyn 2.

For obtaining maximum loading, stemming is held to only 5 ft. Detonation is effected by Atlas Rockmaster ms. delay caps (Nos. 1 to 6), each cap being placed in the bottom charge. A typical firing pattern is as follows: first two rows, 3, 2, 1, 2, 1, 2, 1, 2, 3; next two rows, 4, 3, 2, 3, 2, 3, 2, 3, 4; fifth row, 5, 4, 3, 4, 3, 4, 3, 4, 5; and last row, all 6's. Fragmentation has been very good, and the yield has averaged 3½ tons of stone per pound of explosive, with each hole accounting for 140 tons of stone.

Loading is handled by four Northwest shovels, which are powered by Murphy diesel engines and carry Amsco buckets; these include three 80D's (2½ cu. yd.) and one Model 6 (1½ cu. yd.). The haulage units comprise two Euclid 8TD (22 cu. yd.) trucks, three Euclid 65FD (15 cu. yd.) trucks, and four Allis-Chalmers R200, 12 cu. yd. rock wagons—all end dumps. Two Caterpillar D7 tractors are used for quarry cleanup and road maintenance.

Stone is dumped into a 30-ton hopper, and fed to the primary crusher by a 50-in. x 14½-ft. Cedarapids heavy duty manganese apron feeder. Inclined at 8 deg., the feeder is chain driven at 80 f.p.m. by a 25-hp. electric motor. The material is discharged over a 53-in. x 3-ft. manganese bar grizzly with 4-in. openings, the oversize entering the crusher via a chain curtain. The crusher is a Model 5360H Cedarapids double-impeller impact breaker, the impeller and breaker bars, and liner plates being manganese. Each impeller is driven at 360 r.p.m. by a General Motors 200-hp. diesel engine. The crusher discharges to an inclined 42-in. belt conveyor, 155-ft. centers, which leads to a 30-ton surge feeder hopper.

Minus 4-in. material from the grizzly is taken by an offbearing 30-in. conveyor to a 4- x 12-ft. double-deck scalping screen. Depending on the wetness of the feed, the screen rejects minus 2 in. or minus 1¼-in. material to a 24-in. "waste" conveyor. Oversize is returned to the primary conveyor by a 24-in. horizontal conveyor, 70-ft. centers, which discharges about 10 ft. above the primary unit. To minimize belt wear at the loading point, the feed is effected by a stepped chute which utilizes the stone box principle.

From the surge bin, the material is fed at right angles by a 42-in. x 9-ft. apron feeder to an inclined 42-in. conveyor, 160-ft. centers, which leads to the top of the screening plant. There the stone drops to a stone box, from which it is fed through gates to four 4- x 14-ft. Cedarapids horizontal triple-deck screens; these are mounted on a common level, two to a side. Normally only two decks are used, with screen openings of 3- and 1¼-in., respectively (the top deck serves as a relieving deck).† Minus 1¼-in. stone from each screen—the desired product—drops to a 36-in. collecting conveyor which in turn discharges to the radial stacker. Rejects from each screen pair are chuted to two of the 4033 hammermills, which are also mounted two to a side. The feed is effected through a stone box, with a shut-off gate to each mill; this allows one mill in the pair to continue operation if the second is out of action. Each pair of hammermills discharges to an inclined 30-in. conveyor which returns the crusher product to the secondary conveyor (and then to rescreening).

The hammermills, built with manganese grates, hammers, hammer arms, and liners, are the two-row spinner type (rather than three), with 16 hammers to a mill. Each is V-belt driven at

†To produce agstone, the third decks have also been fitted with ½-in. square mesh cloth, the product being carried to stockpile by an inclined 24-in. conveyor.

Left to right: C. B. Moore, divisional sales manager; Gene Mason, general sales manager; Don "Red' Evans, superintendent at Eskridge; Dean Curphy, assistant general production manager and Sid Moore, president. All but Mr. Evans are from the Cedar Rapids, Iowa headquarters

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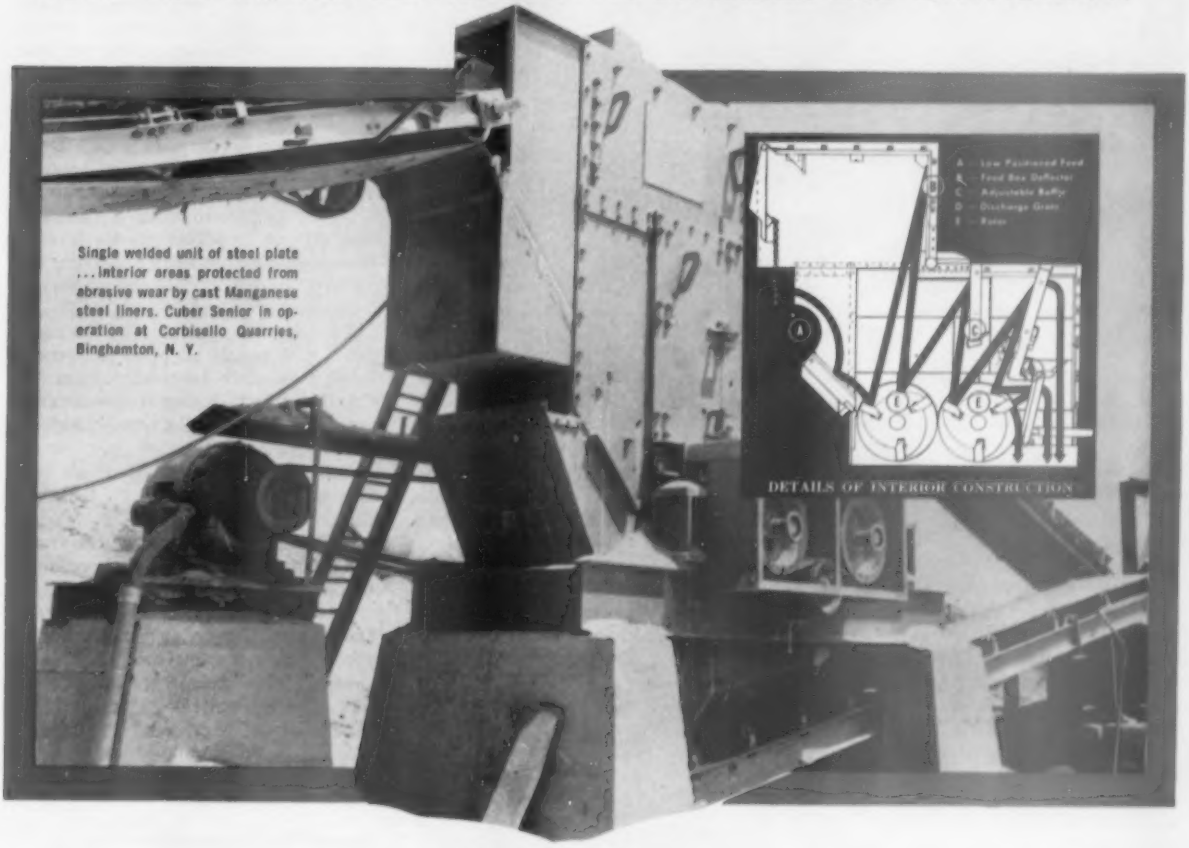
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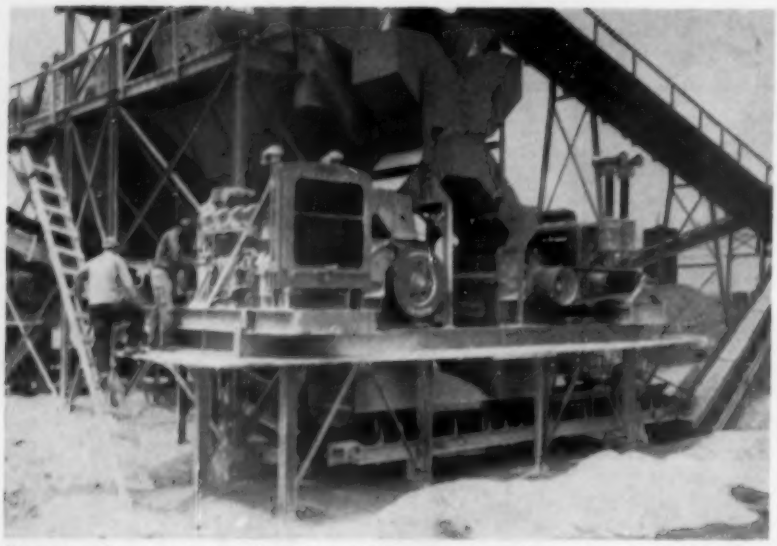


Close-up of two hammermills with individual diesel engine drives. Crusher product return belt conveyor is to the right

800 r.p.m. by a diesel engine (three G.M.C. 110's and one Caterpillar D-17000, respectively). Because of the intensive wear the hammermills are subjected to during round the clock operation, the company has established the practice of rebuilding the hammers of two of the machines with hardsurfacing welding rods on alternate days; this is accomplished during a one hour "maintenance" period beginning at 6:30 each evening. Badly worn hammers are replaced. This maintenance procedure assures maximum operating efficiency and production of quality products.

Base course material from the collecting conveyor is discharged to the radial stacker via a special collecting and discharge hopper. Samples are collected by swinging the steel sampler box across the full section of the opening, thus assuring a truly representative sample. The sampler box, measuring 24-in. long x 6 in. wide x 8 in. deep, rides at the end of a 7-ft. swinging arm, which is swung through by two men. The arm is made by welding two channel frames together to form a box beam.

The radial stacker carries a 36-in. belt conveyor, 85-ft. centers, which can be swung through 180 deg. and also boomed up or down to vary the stone drop. The conveyor is driven by a 50-hp. tail pulley drive, while 5 hp. reversible gear motors handle travel and booming operations. Both the stacker and sampling device were built by the company.

The stockpile is served by three 36-in. tunnel belt conveyors, 75-ft. centers, which radiate out to truck loading. Each is driven at the head pulley by a 40-hp. motor, and can handle up to 800 t.p.h. To prevent segregation during loading, the company installed a 36-in. x 36-in. "spreader" chute on each conveyor which breaks the stone flow into several streams, thus spreading the load. This is done by means of four baffle plates welded in alternate arrangement inside the loading chute.

A Michigan 175A 3-cu. yd. front end loader and a Caterpillar D6 Traxcavator are used for loading from the stockpile. The former machine loads 300 t.p.h. or more. Weighing is handled by two 30 ton, 30-ft. Fairbanks-Morse truck scales, with each scale handling at times one truck per minute.

A 36-in. radial stacker, 85 ft. centers, which can be moved up or down and swung through 180 deg. Sampler is shown to the left

A 12-cu. yd. rock wagon dumping into primary apron feeder

The entire plant is run either directly or indirectly by diesel power. Besides the five crushers, individual diesel engines (G.M.C. 671 units) drive the primary and secondary conveyors. All other machinery is driven by electric motors operating on 440 volt, three-phase 60-cycle current which is furnished by two G.M.C. 110 150 kw. diesel generator units. Each diesel engine is equipped with a Donaldson moderate silencing exhaust muffler. Diesel fuel is supplied from a 12,000-gal. tank which is mounted high enough to permit gravity feed to each engine except the one driving the primary conveyor; this unit is served by a small oil pump.

The plant was designed by the company, with nearly all plant equipment being supplied by Iowa Manufacturing Co. Don "Red" Evans is superintendent, John Waalk, night superintendent, and Chas. Ballard, timekeeper.

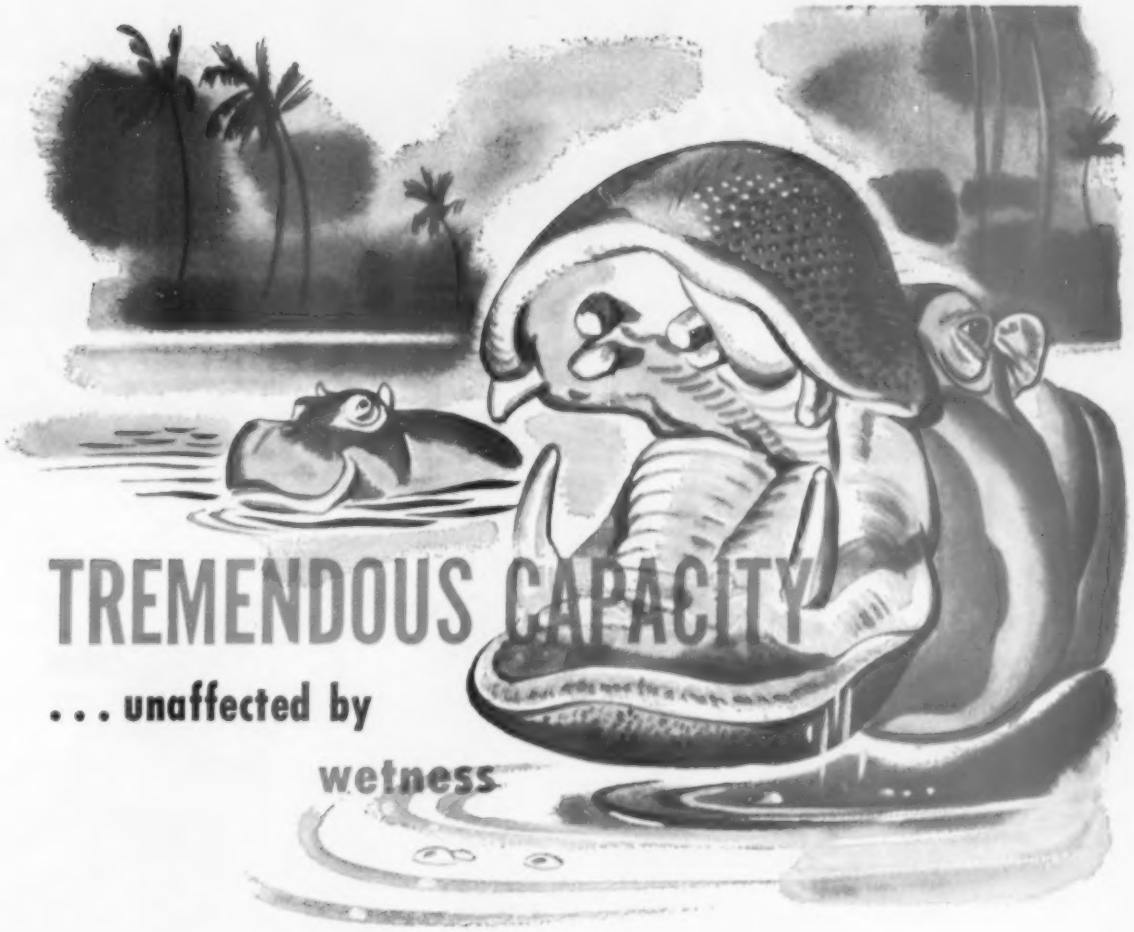
Officers of Concrete Materials and Construction Co. are F. E. Bellamy, chairman of the board; S. P. Moore, president; K. K. Kinsey, secretary and general manager; L. Spaight, treasurer; R. H. Neighbour, vice-president; Marvin Nelson, general production manager; Dean Curphy, assistant general production manager; Gene M. Mason, general sales manager; and C. B. Moore, divisional sales manager. One of the largest aggregate producers in the U. S., the company operates 17 plants throughout Iowa and Kansas.

Speed Up Expansion

INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago, Ill., has announced that new facilities for doubling the present output of dicalcium phosphate at its Bonnie plant, located near Bartow, Fla., will be in full-scale operation early in July, six months ahead of schedule. According to Howard F. Roderick, vice-president of the Phosphate Chemicals Division, the advancement of the completion date was due to "constantly increasing demands, plus an acute shortage of this high-quality feed supplement."

Belgium Cement Output

BELGIUM reports 1955 cement production of 4,817,000 tons. This is a 2-percent rise since 1951, a period that has seen world output jump 55 percent. Exports stand at two million tons for 1955, 42 percent above the 1950 figure.



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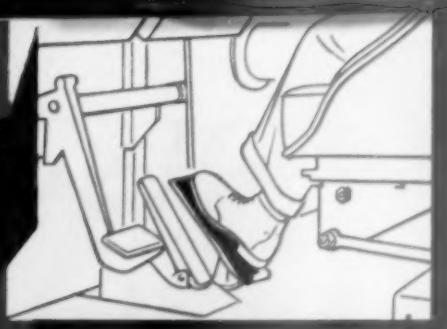

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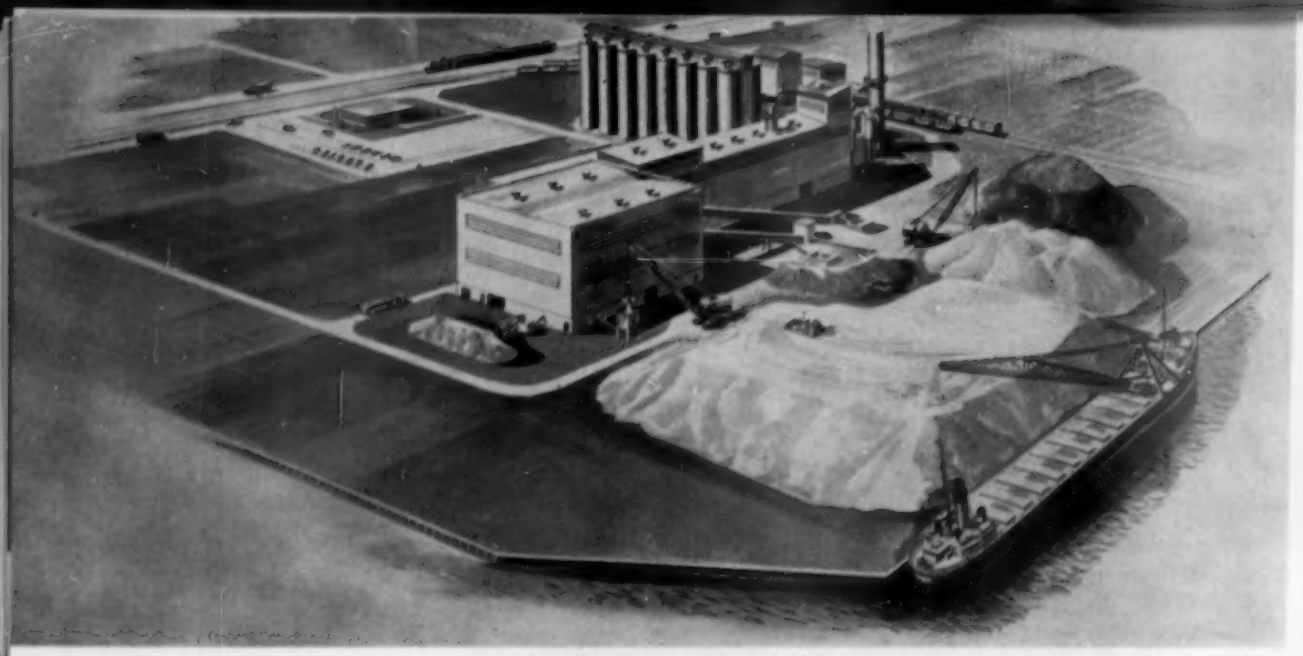


Artist's conception of the new Marquette cement plant to be built in Milwaukee, Wis.

By JOSEPH N. BELL

Marquette Plant First to Use New ACL Manufacturing Process

JUST A FEW BLOCKS AWAY FROM DOWNTOWN MILWAUKEE, an event of first-rate importance to the cement industry is now taking shape. There, the Marquette Cement Manufacturing Co. is constructing a new 1.25 million bbl. cement plant. New cement capacity in this day-and-age of widespread plant expansion is no novelty. But the process by which Marquette plans to manufacture its Milwaukee cement and the fact that the Marquette company is meeting head-on one of the cement industry's foremost problems—that of dust collection — just a few blocks from the heart of a large and busy metropolis are developments which the whole industry will watch with interest.

These developments were underscored late in May when the Allis-Chalmers Manufacturing Co. unveiled in Carrollville, Wis., a pilot cement plant which dramatically demonstrates the process Marquette will use. Known as ACL, this new process in cement manufacture will—according to Allis-Chalmers officials—offer three distinct advantages in making cement: (1) it cuts down by 50 percent the amount of kiln space required by conventional units; (2) it reduces fuel consumption considerably; (3) it offers the lowest dust loss of any rotary kiln cement process known in the world today.

These ambitious results are accomplished mainly by a unit known as a pelletizer and a traveling grate which dries and partially burns the pellets before they enter the kiln. The pelletizer is a simple device which converts the finely-ground raw mix to moulded pellets about the size of marbles. (They retain this size and shape when they emerge from the kiln). The traveling grate replaces what is normally referred to as the feed end section of a conventional kiln. Here the pellets are first dried uniformly by a downdraft flow of gases and are then partially calcined (25 to 35 percent) in a preburning chamber before entering the feed end of the kiln. This double pass of gases through the pellet bed effectively removes most of the dust from the pellets.

The Allis-Chalmers pilot plant — where about 10 ACL-processed barrels of cement are now being produced daily—represents a considerable investment in the future of the cement industry. It is also the result of a number of years of experimental work sparked by Dr. O. G. Lellep, a German scientist who brought many European refinements with him to America when he began experimenting with what is now the ACL (Allis-Chalmers-Lellep) system. Similar methods have been used quite successfully for a number of years in European cement manufacture. The Marquette plant in Milwaukee will be the first double-pass ACL system to be installed in the United States; it will be followed sometime next year by the Diamond Portland Cement Co. in Middle Branch, Ohio. So far, these are the only two companies to definitely indicate their intentions to give ACL a try.

According to Frank Moyle, Marquette's vice-president in charge of operations, "The Marquette decision to use ACL in Milwaukee was motivated primarily by four factors: (1) high fuel economy; (2) the elimination of dust loss in an area where a dust

Pan type pelletizer designed for the ACL system. Note uniformity of pellets being discharged onto belt which carries them to traveling grate

problem could prove catastrophic; (3) reduced space required for the kiln in a congested area where space is at a premium; and (4) the expectation that we will obtain a higher grade of clinker than from the ordinary rotary kiln."

The new Marquette plant is expected to be completed and in operation by December of this year. The pilings and foundation work have peen completed, and the structures are now beginning to rise. (See artist's rendition shown on preceding page).

The savings claimed by Allis-Chalmers for the ACL system are considerable—and will undoubtedly influence cement manufacturers from coast to coast to watch the new Marquette plant closely. Concerning the economies of ACL, E. H. Baxa of the Allis-Chalmers processing machinery department, says:

"A commercial ACL installation producing 4000 bbl. of cement per day will save from $10,000 to $30,000 per year just on the recovery of dust—as contrasted with a conventional dry process kiln. This, of course, doesn't take into account the advantages of better relations in the plant community. The ACL system, followed by a rather modest electrostatic precipitator, will result in dust losses six to seven times better than the requirements for the Los Angeles air pollution code, which is the most stringent in the country. Frankly, in most cases, the ACL exit gases will be discharged to atmosphere cleaner than the surrounding air.

"In addition, the yearly fuel savings for a commercial ACL system is a sizeable figure, amounting to between 10 and 20 cents per barrel, depending on the type of fuel used. This means a savings of between $102,000 and $240,000 per year in fuel for a 1.2 million barrel plant."

Right now, the ACL system can be used only in dry process plants. "But," says Mr. Baxa, "we're beginning to think about its application to wet process plants as well."

In the meantime, experimental work under Dr. Lellep will continue in the newly-completed pilot plant, which is now available for inspection. Located about 15 miles south of Milwaukee near the town of Carrollville, it should be an object of considerable interest and curiosity to cement manufacturers.

Canada Imports Cement

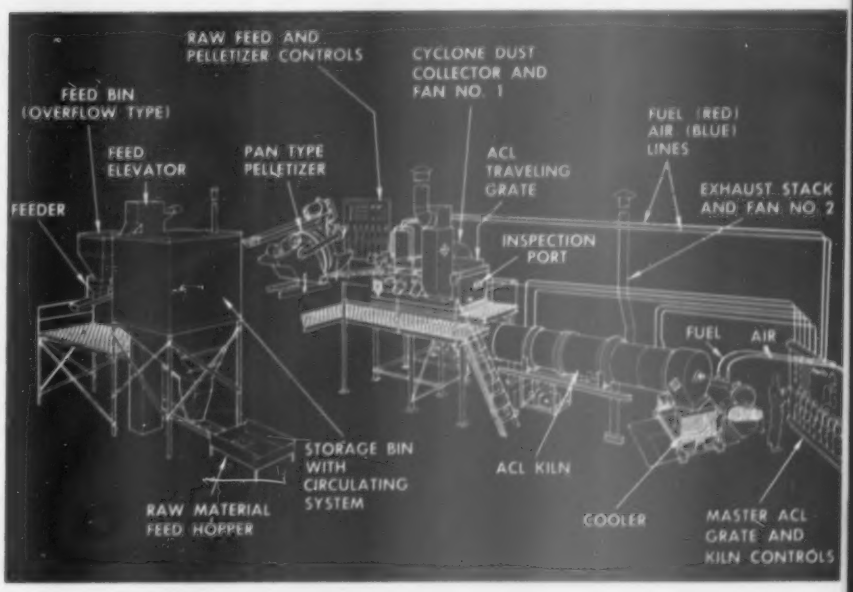
POLAND AND CZECHOSLOVAKIA are negotiating to supply 280,000 tons of cement to Canada to relieve the immediate shortage in the construction industry.

Although the price is considerably higher than Canadian cement prices, it is reported that an arrangement was worked out with the Department of Trade and Commerce to apply the value of the cement to an Iron Curtain debit involving 13 million bushels of wheat purchased last year.

India Controls Cement Imports

THE INDIAN MINISTER FOR COMMERCE stated that his office will take over the import and distribution of cement. Control will be exercised in the same manner as is now being done with iron and steel.

The Government plans to discourage demand by raising prices, a technique designed to curb inflation.



Flow diagram of pilot cement plant using pelletizer and having grate feed system

Aerial view of Port Elizabeth plant. Recent plant renovations provide added production flexibility

Plant Expansion

Tuned to Changing Market Demands

FOUNDRY SANDS

. . . meeting more rigid AFS specifications are being produced in large volume at modernized Port Elizabeth, N. J. plant of Millville Silica Sand and Gravel Co.

By GEORGE C. LINDSAY

PRODUCING FACILITIES at the Port Elizabeth, N. J. industrial sand plant of the Millville Silica Sand and Gravel Co. have been altered from time to time to satisfy increasingly rigid demands of industrial sand consumers. The most recent plant changes, made early in 1956, give the plant the ability to make sands that exceed specifications of AFS-100, as set by the American Foundry Society. Demand for those products is growing rapidly.

New plant additions include a 25-t.p.h. Smidth ball mill, which reduces AFS-30 grade to approximately AFS-140 grade sand. A sixth Shaw-type liquid cone classifier has been installed to collect grades in excess of AFS-100. The plant's former ability to produce and blend many products to exact specifications of consumers has been improved, and the ability to supply additional short-supply sands has been added.

Rapid technological growth in the industrial sand industry has pointed up the need for giving more attention to production facilities at sand processing plants. Since World War II, foundries and steel companies have taken advantage of processes that called for the use of extra-fine sized sands.

Millville's Port Elizabeth plant has undergone a series of changes since it was built in 1939. Plant changes in each case were made to keep production of products in line with growing demands for foundry and steel sands. Before 1946, the plant was equipped to produce high-grade Manumuskin, N. J. industrial silica sands in grades up to AFS-80 specifications. As the market for finer sand sizes grew, Millville kept in step by altering production facilities. Pumping, screening and classifying capacity was increased in 1946, a laboratory was installed and a sales organization was formulated. The result—production and sales increased each year. The recent plant renovation is expected to continue the trend for the company.

Three major types of products are made at the Port Elizabeth plant, although the company accents production of fine grades of foundry and steel sands and sand-blast sands. In addition, several specialty sands are produced. Stone products are considered a by-product of the plant and are sold to local sand and gravel distributors. Grit, or intermediate sized material, is a secondary specialty. That material normally is dried in a rotary kiln dryer and is classified over three Universal two-deck vibrating screens into four grades of sand-blast products and two grades of sand. Sand products are processed through a Latimer scrubber, then are classified into six normal grades by Shaw liquid cone classifiers. Facilities in a Dry Plant provide for

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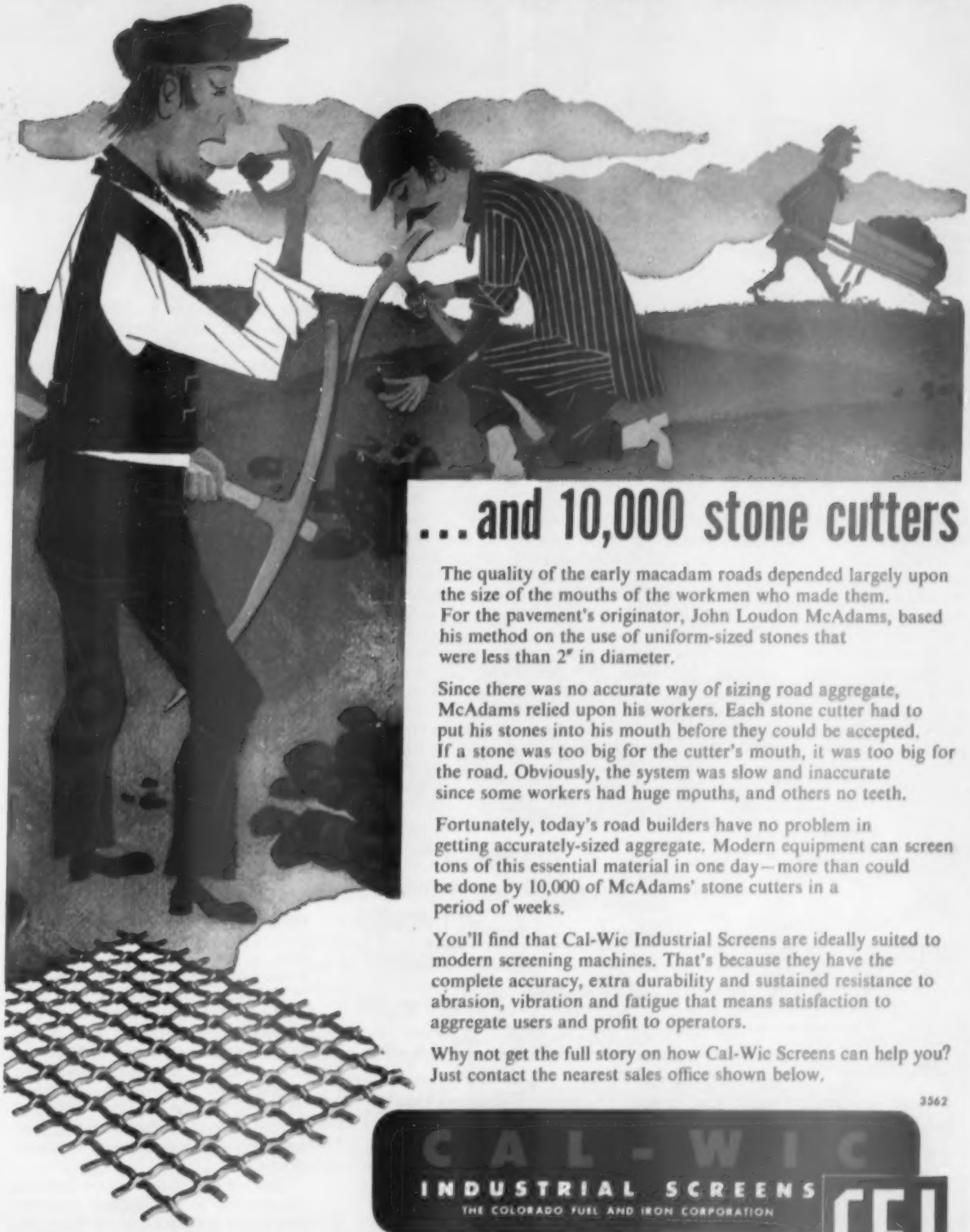

...and 10,000 stone cutters

The quality of the early macadam roads depended largely upon the size of the mouths of the workmen who made them. For the pavement's originator, John Loudon McAdams, based his method on the use of uniform-sized stones that were less than 2" in diameter.

Since there was no accurate way of sizing road aggregate, McAdams relied upon his workers. Each stone cutter had to put his stones into his mouth before they could be accepted. If a stone was too big for the cutter's mouth, it was too big for the road. Obviously, the system was slow and inaccurate since some workers had huge mouths, and others no teeth.

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Left: Classifying section viewed from launder discharge end. Launder overflow is discharged through 6-in. vertical pipe to pond. **Right:** Dry plant contains drying, screening, storage, blending and loading facilities. Belt conveyor installed on ground between two rows of 100-ton bins may receive six or less sizes in desired combinations for blending

drying, screening, storage, mixing and loading of any size below gravel size. Those facilities allow the maximum of flexibility in preparing products in strict accordance with customer specifications. Products can be shipped wet or dry, or can be prepared with control over moisture content.

Raw product is dredged from the Manumuskin area of New Jersey. The area is a small elongated deposit found along Manumuskin Creek in Maurice River Township of Cumberland County. Manumuskin sands have an excellen reputation in the foundry trade. Washed sands from the area average 98-99 percent silica. They are shipped from the Port Elizabeth plant as far south as Norfork, Va. and as far west as Pittsburgh, Penn. Although the plant is located near the center of a large glass-producing area, no glass sands are produced there. The company specializes in foundry and sand-blast products, as do a half dozen other plants in the state.

Millville Silica's present active reserve area consists of 1000 acres in the Manumuskin area. Approximately five acres have been dredged in the active area, and an average of one acre per year is pumped. A new deposit about five miles from the plant is being opened. It eventually may involve as many as 200 acres. Two dredges are operating on the 1000-acre active pumping area at present. One is equipped with a 20-ft. cutter head and the other has a 40-ft. head. Both have 8-in. suction heads. Each dredge is operated with a 200-hp. G.E. electric motor, and each is equipped with an 8-in. centrifugal pump with impellers and plates of the company's own design. They are cast of special alloy metal to resist abrasion. Port Elizabeth Foundry Co. cast the impellers and plates. Machining work was done by Delaware Bay Shipbuilding Co. To date, the company has had excellent experience with pump life.

Each dredge pumps at the rate of 100 t.p.h. Maximum pumping range of each is 2000 ft., without booster pumps. Inasmuch as plant feed capacity is 100 t.p.h. of solids, one dredge at a time normally supplies the plant. The area of dredging varies according to market requirements. The market for fine sands normally is greater from the first of March through the middle of December each year. Production of sand-blast products is stressed the remainder of each year.

Dredged material presently is being pumped through 600 ft. of 8-in. steel pipe line to the top of the wet plant. Pipe connections from the floating barges in the pond to the main steel line are of rubber piping, to allow for swinging of the barges along the pond bank. The 40-ft. ladder on the large barge can dig to a greater depth than 40 ft. in the deposit, if necessary. Water level in the pond is lowered with the use of 6-in. centrifugal pumps, to allow for deep dredging.

Preliminary separation of solids into three basic products is made in the Wet Plant, which receives material pumped from the dredges. Feed passes over a steel fan table that effects an even spread over a near-vertical stationary "breaker" screen. Over product of that screen is processed over a 6- x 14-ft. Universal vibrating screen into plus ¾-in. oversize, ¾ x ⅜-in. stone, and minus ⅜-in. pea gravel. Each size is chuted into a 50-ton storage bin installed over a railroad loading track. Through product of the "breaker" screen strikes a stationary "plaster" screen that separates grit and sand products.

Grit, or plaster-screen over product, is collected in an inclined conveyor box in the bottom of which is a 12-ft. long 16-in. diameter screw conveyor that feeds grit to ground storage. Grit product is later processed through the

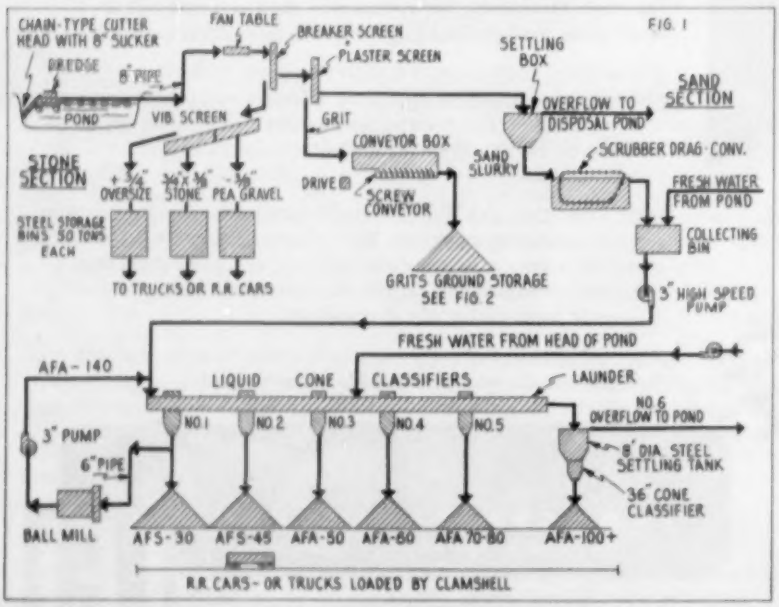

Fig. 1: Wet Plant where dredged material is screened, cleaned and classified into industrial sands for further processing in the dry plant

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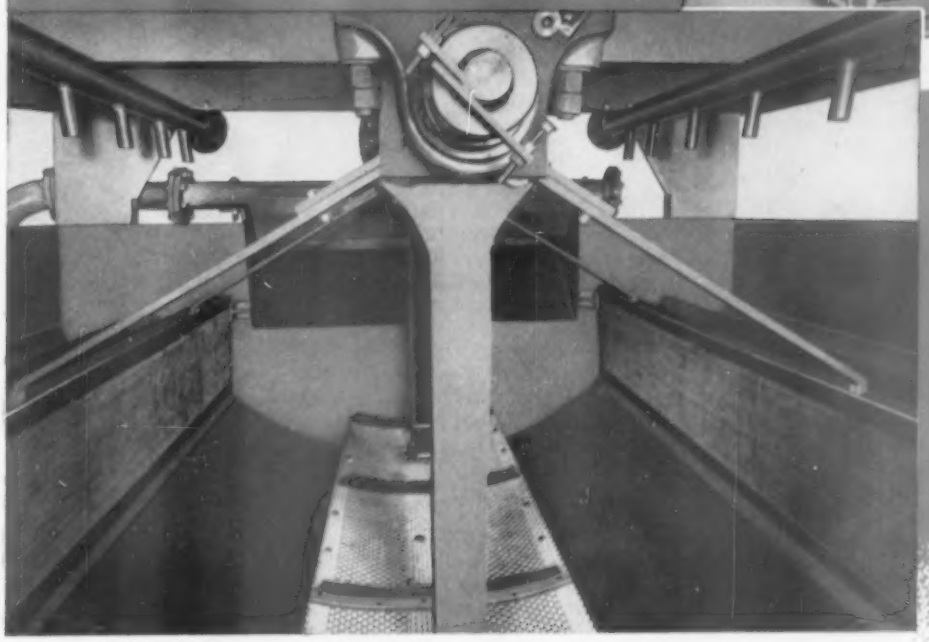
because of its large productive pool area



Left, view of the interior of the OCC Heavy Media Vessel, illustrating its large pool area; view is from discharge end of vessel. Above, exterior view: float and sink discharges on left and feed chute on right.

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Since the introduction of the Heavy Media process, the development of a separator whose simplicity would match that of the process has been an aim. This has been achieved through the design of the OCC Vessel illustrated above. The rake suspended in the center oscillates the width of the vessel. In so doing, it maintains in productive use practically the entire volume of the vessel, in contrast to other separators employing only a fraction of same. The result is improved metallurgy and increased economy.

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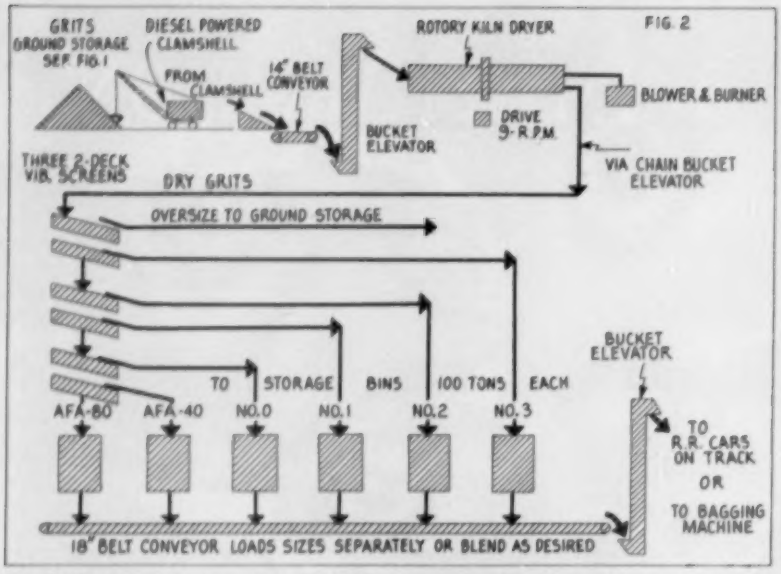


Fig. 2: Dry plant receives ground stored materials for drying, screening and blending to customer specifications

Dry Plant. Through product of the plaster screen is fed to the sand washing and classifying plant.

Feed to the sand plant is received in a large settling box in which speed of flow is reduced to effect settling of solids and preliminary separation of foreign material. Overflow of the settling box is sluiced to a disposal pond. Settled solids from the box are fed to a Latimer scrubber where final washing is performed. A drag conveyor removes washed sand from the scrubber for delivery into a collecting bin where fresh water fom the pond is added. A 3-in. Wilfley high-speed sand pump moves the sand-water mixture to a launder in the liquid cone classifying section. Fresh water is added from the pond to each classifier.

Prior to this year, four 36-in. and one 24-in. Shaw-type liquid-cone classifiers collected five sand grades ranging from AFS-30 to AFS-80. A sixth 36-in. classifier was installed this year at the end of the classifier launder to separate and collect AFS-100 plus grade products. The new classifier is installed in conjunction with a 9-ft. diameter round, steel float or settling tank with an inverted conical bottom. Purpose of the tank is to slow down velocity of the sand-water mixture so that maximum efficiency in separation of fines is obtained in the new classifier.

All cone classifiers automatically discharge collected sand grades to ground storage. However, a 25-t.p.h. Smidth ball mill with normal capacity for 18 tons of 3-in. alloy balls may receive classified sand from the No. 1 cone classifier through a 6-in. pipe connection. The ball mill reduces size to AFS-140 grade, which is re-introduced to the classifier launder. Addition of the ball mill and the No. 6 classifier allows the plant to produce and collect high-quality sand grades in excess of AFS-100.

The Dry Plant is an important section of the operation. Grit products or any of the collected sand sizes may be moved from ground storage into the Dry Plant for drying, additional screening, blending and loading. A ½-cu. yd. crawler-mounted diesel-engine operated clamshell is used for that work. Dry Plant feed moves by gravity from a partial hopper onto a short 14-in. belt conveyor. The latter transfers feed to a Chain Belt bucket elevating conveyor that discharges into a rotary kiln dryer with capacity for drying 50 t.p.h. The dryer is driven by a 15-hp. Westinghouse motor through gear reduction and chain drive to girth gear. The dryer is equipped with Hauck burner and blower. Fuel oil is supplied through a small Viking centrifugal pump. No automatic controls are available, but an experienced dryer operator adjusts heat manually according to requirements.

Dried products are discharged into a bucket conveyor that elevates them 75 ft. for feed to a battery of three 4 x 8-ft. Universal two-deck vibrating screens. In the winter time when sandblast products are being produced, sizing normally is into Nos. 0, 1, 2 and 3 sand-blast sizes and AFS-40 and AFS-80 sand. During the summer, other sizes of sand may be processed and collected. Six steel 100-ton bins receive the various products from the Dry Plant screening section. Sizes from the bins may be loaded separately onto an 18-in. Robins belt conveyor for delivery into railroad cars through a 12-in. wide, 50-ft. high Latimer rubber-belt bucket conveyor. However, blending of various sizes may be made as desired through controlled loading of any size onto the belt conveyor. This feature is important to the plant's ability to supply products to exact specifications of customers.

A second rotary-kiln dryer, similar to the one in the Dry Plant, is available for drying specialty sands or any size of products from ground storage below the liquid cone classifiers. This dryer adds flexibility to plant operations. Two Mack 10-ton, end-dump trucks are available to haul sand products between storage and the auxiliary dryer.

Port Elizabeth plant produces foundry and steel sands in accordance with exact customer specifications, which vary considerably. For that reason, plant management hesitates to specify mesh sizes of the numerous screens used because they are changed so often and no set can be designated as standard except the "breaker" and "plaster" screens. Even they are changed frequently.

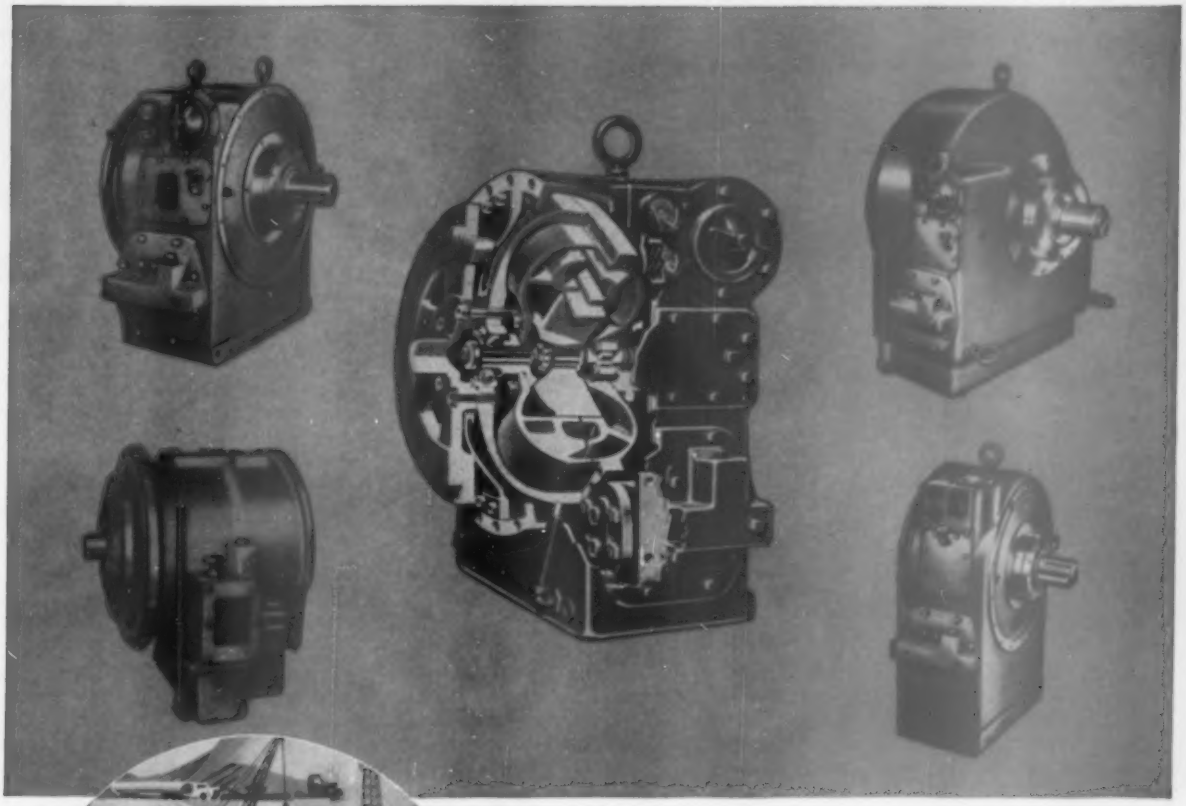
A laboratory is considered a necessity to the plant's ability to prepare products to exact specifications. Located on the plant site, its facilities are used daily to control product sizes all the way from dredge pond to railroad car. There are several basic tests made in the laboratory, most of them being made daily.

Prospecting Test. In prospecting new areas, or in determining quality and sieve analysis of deposit at any location, bank samples are obtained through standard procedure for laboratory analysis. Prospecting samples are collected at each foot of depth of prospect hole. These qualities are determined on each bank sample: size (including screen analysis), color, quantity of deposit, amount of overburden, location (with reference to available transportation facilities), and chemical properties. All qualities combine to determine whether an operation may be economical.

Pumping Test. Determination of quality and gradation of material being dredged and pumped is important. Samples are taken periodically to determine grade and size of raw product at all locations around the pond. Size is particularly important, for it determines locations for active dredging in accordance with customer demands for large or small sized products.

Basic Tests. Normally, three basic tests are made daily in the laboratory:

(Continued on page 90)



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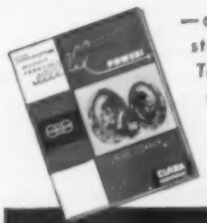

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Bank Analysis

Millville Silica Sand & Gravel Co. AFS-45

Port Elizabeth, N. J.

LABORATORY TEST

Subject	Rec'd on									
	6									
Date Grade	12									
	20	20					20			
Car No.	30	82					164			
	40	248					744			
Customers Name	50	256					1024			
	60						910			
No. of Bags	70	182					938			
	80						480			
Tons Bulk	100	134					112			
	140	48					40			
Order No.	200	8					60			
	270	2								
Time	Pan	2					44.92			
	Total	982								
Initials										

Fig. 3: Standard method of making AFS ratings

clay test, organic test and car test. Each test is made in accordance with prescribed standards acceptable by the industry. The clay test determines the amount of clay in the finished products. A clay content of ⅛ of one percent in any grade produced is an absolute maximum. If clay content runs high, dredges are moved to new and more suitable locations.

The organic test is made to determine the presence of organic matter in final products. The sand sample is agitated in a solution of sodium hydroxide (sometimes caustic soda is used) and then is allowed to stand for 24 hr. Color of the covering fluid determines amount of organic matter in the sample; the darker the color, the greater the content. Care is taken to keep the color as clear as possible. If the test proves a high organic-matter content, dredges are moved to a new location.

Each loaded railroad car is tested to determine sieve analysis, and to indicate the grade of product loaded. A sampling rod made of 2-in. steel pipe is used to collect samples from each pocket in a gondola car. The sample is reduced to a 100-gram representative sample and is vibrated through a set of screens for 15 min. to determine quantities maintained on each screen size. The results should check with customer specifications.

Determination of the AFS standard is a complicated but important procedure. In addition, customer specifications on gradation of sizes within any AFS grade may vary considerably.

Fig. 3 shows a standard method of determining AFS rating of products and also the gradation of sizes by sieve analysis in each sample. Data in the left column indicate the gram weight of the sample retained on each sieve size. Data in the right column are obtained by multiplying gram weights by the sieve size immediately above. For example, 8.2 grams were retained on the "30" sieve; 8.2 is multiplied by "20" to give 164; 24.8 times "30" equals 744, etc. Total of the right column is divided by 100 to determine the AFS grade, or 45 in this case.

The analysis shown in Fig. 3 is considered a "4-screen" sand, or one in which at least 10 percent by weight is retained on each of four screens. Difficulty in meeting customer demands lies in the fact that requests are made for a 3- or 4-screen sand in any AFS grade. Screens to contain 10 percent or more of the sample are designated, and they vary widely throughout the industry. It is obvious that extreme flexibility in dredging, classification, sizing and blending phases of operations be maintained to satisfy the changing and varied market requirements. The Port Elizabeth Plant's recent plant renovation program provides that degree of flexibility. Also, any phase of the operation from dredging through changing screens or classifier settings to blending may be varied to obtain the type and gradation of products desired.

Maintenance is a phase of operation that receives much attention. Necessity to change screens often to obtain flexibility in production, plus the fact that abrasive materials are being handled, results in a high maintenance factor in the operations. Abrasive resistant screens, such as stainless steel and special alloy types, are used. Even so, they are short lived. Maximum life of screens in the Dry Plant is three weeks, while life of those in the Wet Plant normally is less than a full work week.

Millville Silica Sand and Gravel Co. is headed by Dr. Charles Sharp of Port Norris, N. J. Vice-president and operating manager is B. E. Harper. George Fitzgerald is treasurer. The plant operates two 8-hr. work shifts per day in season. Number of employees in the summer is 35; 22 in the winter.

Port Elizabeth plant is located 7 miles south of a town of that name and 12 miles south of Millville, N. J., in Cumberland County. The plant receives railroad service from the Pennsylvania Reading Sea Shore Railroad.

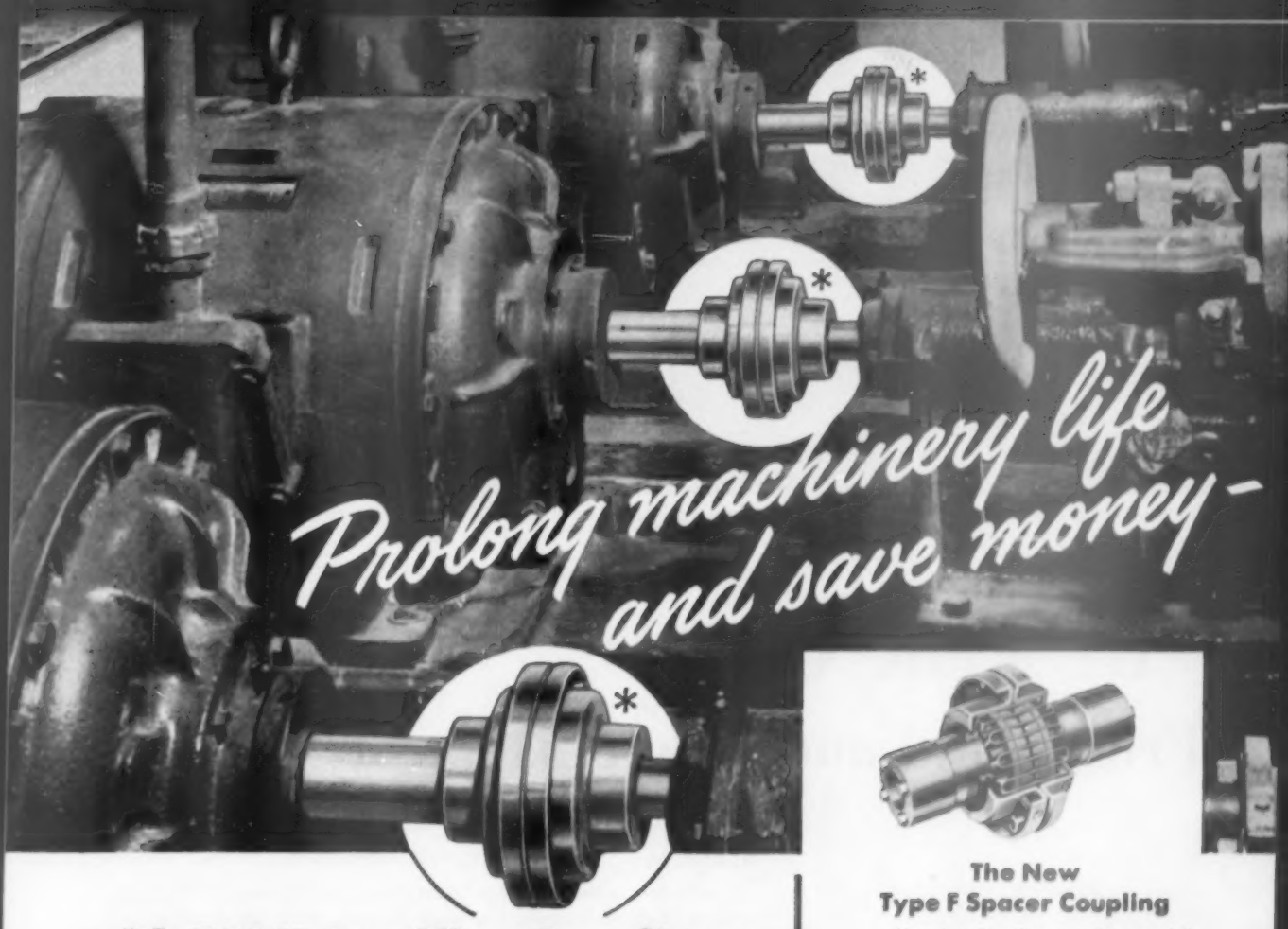
Caution Against Cement Plant Overexpansion

THE CEMENT INDUSTRY, in the midst of its greatest expansion in 30 years, is beginning to doubt the advisability of its program. The industry's present capacity, after five years of expansion, is about 315 million bbl. of cement annually. Present plans and plants being built will increase the annual cement capacity by about 55 million bbl. to 370 million bbl. annually.

Chris Dobbins, president, Ideal Cement Co., Denver, Colo., has said: "If all the presently-announced capacity is built, there'll be too much cement around." J. F. Magee, president, Alpha Portland Cement Co., Easton, Penn., commented cautiously on expansion: "We're not going hog wild . . . If everyone is going to increase 50 percent, we won't sell that much cement in ten years." "What is termed a shortage," stated H. A. Sawyer, president, Lone Star Cement Corp., New York, N. Y., "has actually been a shortage of the lowest price cement in a given market at a given time." Pointing to costly transportation as the major disadvantage, Mr. Sawyer said that capacity now covers total requirements "even with something to spare."

The President's proposed highway program has been a major factor in the expansion plans. Road building in 1955 consumed 55 million bbl., or 18 percent of the nation's production. The federal highway plan being considered might double the regular consumption, but the cement industry's added capacity would be able to meet it with about 15,000,000 bbl. left over.

According to the Department of Interior, an estimated 300 million bbl. of cement were shipped in 1955, an increase from 275.3 million bbl. shipped in 1954.



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Ever since the first Falk Steelflex Coupling was designed and built, we have firmly held to these beliefs:

1. A coupling, to give fullest value, must do more than merely *connect* driving and driven machinery—it must *protect* the machinery and prolong its life.

2. A coupling, to be truly flexible, must overcome the effects of shock and vibration, as well as shaft misalignment.

Proof of the soundness of those beliefs is furnished by the record. More than one million Falk Steelflex Couplings have been used on every conceivable type of industrial application . . . giving trouble-free service, providing maximum protection to connected machinery.

* A single basic type—the famous Type F—fills 90% of all industrial application needs. It is versatile, efficient and economical. And—it is always available from factory, field or distributor stocks, in a wide range of sizes.

Write to Department 247 for engineering bulletin, including selection and dimension tables.

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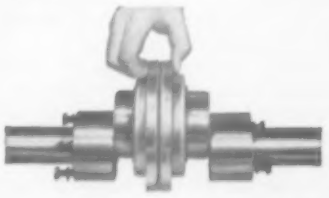
The New Type F Spacer Coupling

Here is a Steelflex coupling specially designed to permit fast, easy installation and removal in horizontal and vertical applications where it is impracticable to move the connected units—or where a space-gap (up to 12 in.) is necessary.

Like all Steelflex couplings, the Type F Spacer gives long, trouble-free service and maximum 3-way protection for connected machinery: it provides torsional resilience to reduce shock and vibration; it accommodates parallel or angular shaft misalignment; it allows free (or limited) end float.

An outstanding feature of the Steelflex Spacer is that it can be installed or removed in one piece (see photo below); no dismantling or servicing of the coupling is required. Pump assemblies can be disconnected and removed without disassembling the coupling, without exposing working parts.



The Steelflex Spacer coupling is prelubricated at the Factory and can be installed, or removed and reinstalled, without disturbing the lubricant—a highly desirable feature.

Dry plant equipped with high tension electro-static equipment for recovery of titanium minerals from sand concentrates. Rotary dryer may be seen to the right

"BLACK GOLD"
From Sand and Gravel Deposit

TITANIUM

. . . minerals recovered by Humphrey Gold Corporation in new Highland operation near Lawtey, Fla., by dredge and then processing in wet and dry plants

By WALTER B. LENHART

ROCK PRODUCTS, in its never-ending search for operating techniques that might put dollars in the pockets of its readers, deviates in this article from conventional plant types to describe the sand dredging, sand de-watering and classification systems of an operation that produces metallic minerals as well as other industrial non-metallic products. The operation is that of the E. I. duPont de Nemours & Co. at their new Highland plant near Lawtey, Fla., some 40 miles southwesterly from Jacksonville.

The plant is of manifold interest because it treats from 1000 to 1400 t.p.h. of sand, and has three of the world's largest rubber-lined centrifugal sand pumps. The plant also uses a simple, new sand de-watering and settling system that handles 18,000 to 20,000 g.p.m. of pulp. A tailing pond disposal system makes use of an acid-lime coagulant to insure clear water to the disposal areas. A "root-hog" is an unusual device that is a part of the dredge pump suction. Its use prevents the pump runner from becoming clogged with debris. Other operating details are of interest to those handling large tonnages of fine material.

Finished concentrates are produced in a floating wet plant, then are sent ashore for processing in a dry plant to recover special minerals. Primary purpose of the operation is to recover titanium minerals that are a part of the ancient beach sands at Lawtey. Zircon and staurolite minerals are present in the deposit. (See footnote).

At the operation are three of the world's largest rubber-lined centrifu-

Showing two spiral units that dewater concentrates from wet plant before sending them to dry plant in the background

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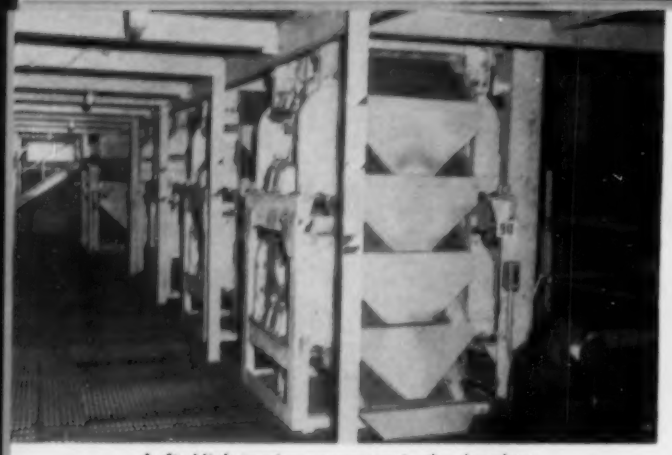
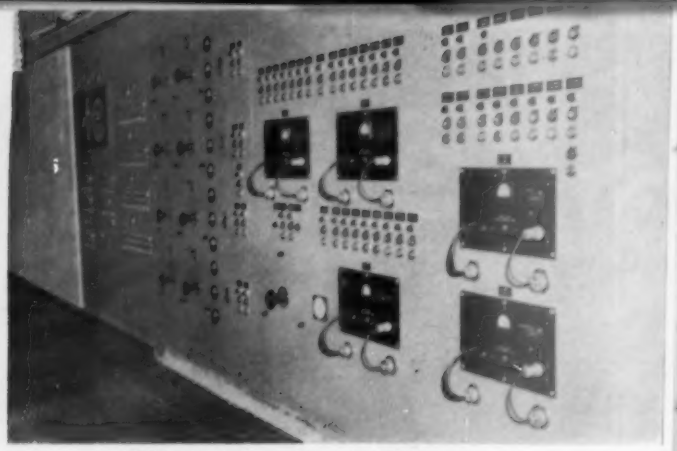


Left: High tension separators in the dry plant



Right: Control panel for electrical equipment

gal sand pumps. One each is used for pumping sand pulp to the two roughers circuits in the wet plant, and the other one is used for tailing disposal purposes. The two former pumps each use a 350-hp. motor; the latter pump requires a 450-hp. motor. The pumps were made by the Georgia Iron Works.

The dredge is 104 ft. long and 40 ft. wide; the hull has 14 steel compartments. A 7-ft. diameter cutter head on the dredge is made up of six spiral blades with ten teeth per blade. It is driven by a 200-hp. Allis Chalmers motor through a Philadelphia Gear Works reduction unit. Digging is to a maximum depth of 65 ft. below water, 53 ft. being average. Practically all sand is minus 80 mesh in size.

A stratum of hard pan is present below water, and it has to be loosened by blasting as well as by the cutter head. The hard pan is a tar-like substance, black in color. It is said to be a residue from decomposing organic matter, and to carry values slightly in excess of the other sand mined. The hard pan is crushed by a Pennsylvania hammermill in the floating plant. The hammermill has a capacity of 250 t.p.h.

After observing the performance of several types of pumps at their own operations, and in the nearby Florida phosphate fields, designers of the Highland plant selected a Pettibone-Mulliken high chromium steel alloy 20-in. sand pump for the dredge. The pump is said to be 18 to 33 percent more efficient than other types. Operators attribute this to pump-runner adjustable features and closer tolerances. The chromium alloy shells last about six months, whereas other metals normally used lasted about 45 days. The dredge pump is directly connected to a 900-hp. Allis Chalmers motor.

A "root-hog" is a part of the suction assembly for the dredge pump. Dredged material first passes over a perforated steel plate with 5-in. diameter openings. Oversize is flushed by incoming pulp to a disintegrator consisting of revolving cutters that are part of the horizontal shaft. Fragments are reduced to minus 2-in. size by the disintegrator. Minus 2-in. and minus 5-in. material goes to the pump's suction.

The dredge has two spuds at the stern. In operation, one spud is used; it acts as a pivot with the boat being moved laterally by shore lines. The cutter head usually is kept at the toe of the sand bank below water, and is swung laterally back and forth. Caving and burying the cutter is not a problem. The cutter turns clockwise, so that when the dredge is swung to the right (with reference to the bank it faces), the cutter works more efficiently and delivers more sand in t.p.h. than when the boat is being swung in the opposite direction.

The dredge pump delivers to a 24-in. steel pipe line serving the wet plant. Each pipe section is 40 ft. long, and each is supported on two steel pontoons. Rubber sleeve connectors are used. A 2300-volt service cable rides on separate pontoons.

Water from the pond in which the floating plant operates cannot be used for all purposes in the wet plant, as it contains organic matter and other non-settling slimes. Fresh water is used for the finishing spirals and pond water for the roughers, cleaners and for make-up purposes. Fresh water is pumped to the plant through 6000 ft. of 20-in. diameter spiral wound steel pipe.

The wet plant flow is shown in an accompanying diagram. Note that pulp from the dredge goes to a screen feed box, thence over three Allis Chalmers vibrating screens operating in parallel. Screen surfaces have ¼-in. openings. Plus material goes to a hammermill, and minus fraction and water flow to sumps. The sumps are water scalpers that remove slimes and organic matter in the water from the dredge operation.

A new type of de-waterer is in use at Highland. It is known as a plate

Dredge with 20-in. sand pump excavates and delivers material to wet processing plant

Footnote:

The "heavies" in the beach sand constitute about 4.3 percent of the total and consist mainly of the following minerals:
Ilmenite, ($Fe\ TiO_3$),
Rutile, (TiO_2),
Leucoxene, an altered rutile,
Staurolite ($H\ Fe\ Al_9\ O_8,\ SiO_4,\ O_{16}$),
Zircon, ($Zr.\ SiO_4$).

Minerals are minus 80- mesh size. The first two are black in color and often classed as "black sands". Zircon is light colored and the staurolite is light brown. The concentrates produced from the wet plant, due to the preponderance of titanium minerals in it, are black in color.

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3. Grinding elements are made of wear-resistant, long-life metals, with grinding balls held to close spherical tolerances.
4. Fully-enclosed reduction gear drive, with anti-friction bearings, and integral pump for automatic pressure lubrication.
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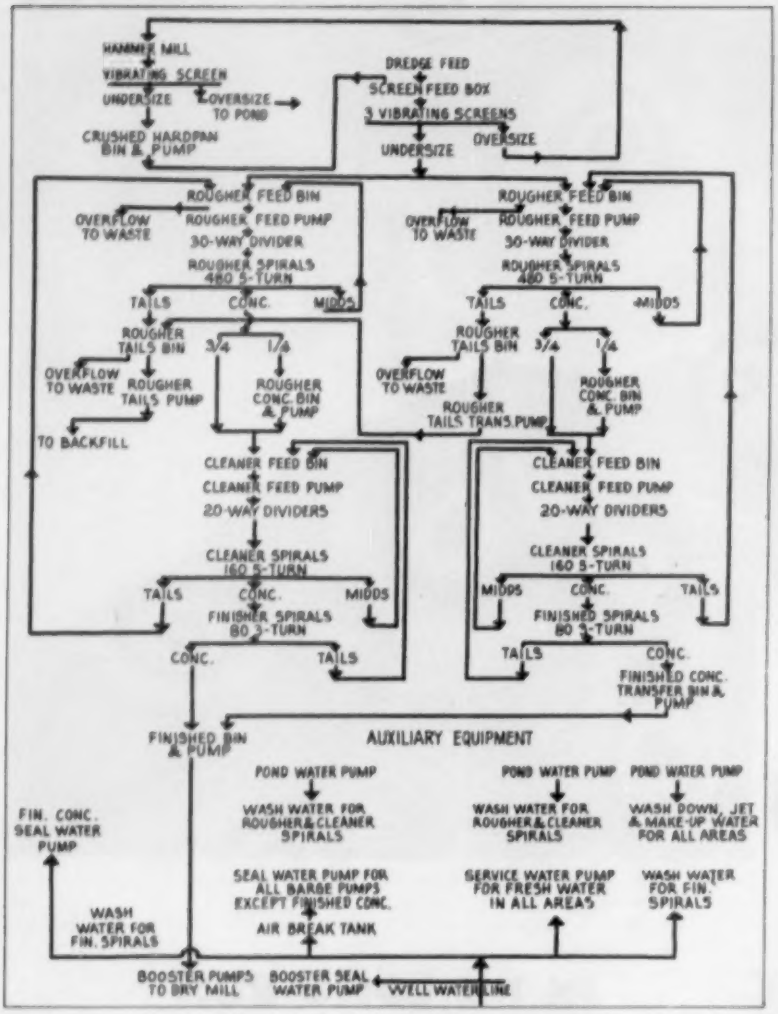
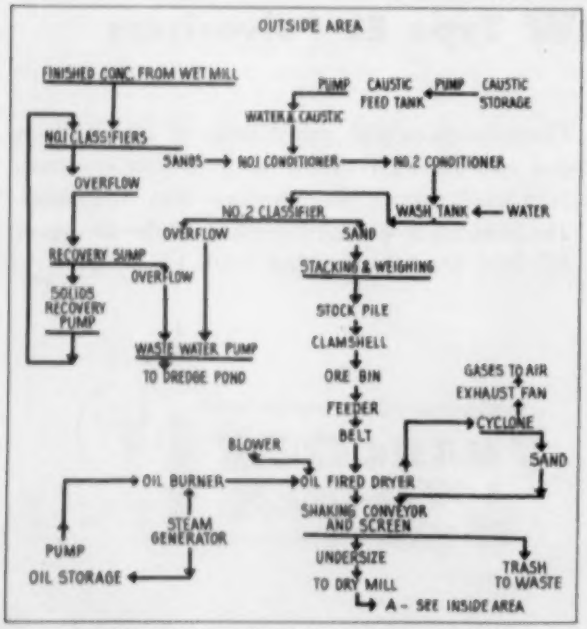


thickener. To help understand the principle of the plate thickener's operation, visualize a glass tube 6 in. long and closed at one end. Fill the tube with water to a depth of 5 in. and add fine sand. If this tube is allowed to stay in a vertical position after shaking, the sand will have to settle through a column of water 5 in. deep. The settling time required may be considerable. But, if the same tube is tipped at an angle of 60 deg. (from horizontal), sand will settle quickly to the side of the glass tube and slide down the tube to the bottom. In that case, sand grains will have to settle only a fraction of an inch. In practice, at Highland, a series of metal plates 1/10-in thick and 24 in. square are hung about ¾-in. apart in the sump tank. Faces of the plates are parallel to each other and slope at an angle steep enough so that the settled sand grains slide into the hoppered tank below. The plate thickeners are the invention of I. B. Humphreys, and are said to be more efficient than other types. They recover more of the finer sizes of sand and, at the same time, adequately scalp large volumes of slime laden water.

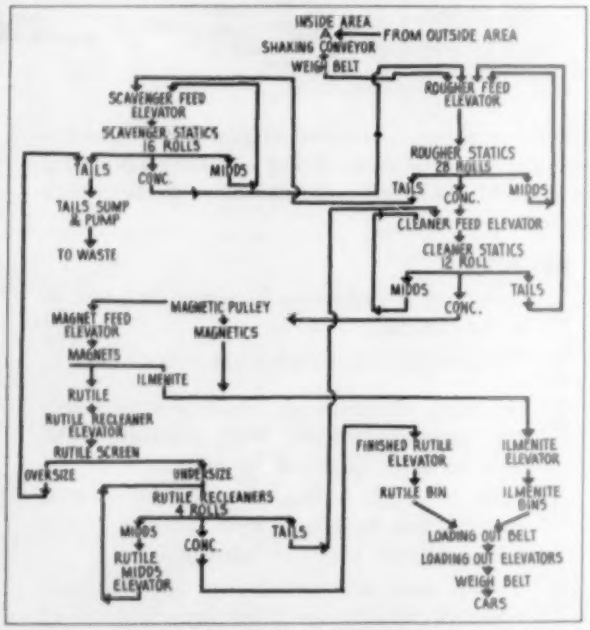
The method of splitting feed for the spiral rougher sections is important to spiral operation. Sand from the Humphrey plate thickeners is first moved by one of the two 20-in. rubber lined G.I.W. pumps to feeder boxes, or feeder heads. The stream is split then into 30 equal fractions.

(Continued on page 102)

Wet mill flowsheet of titanium mineral recovery plant



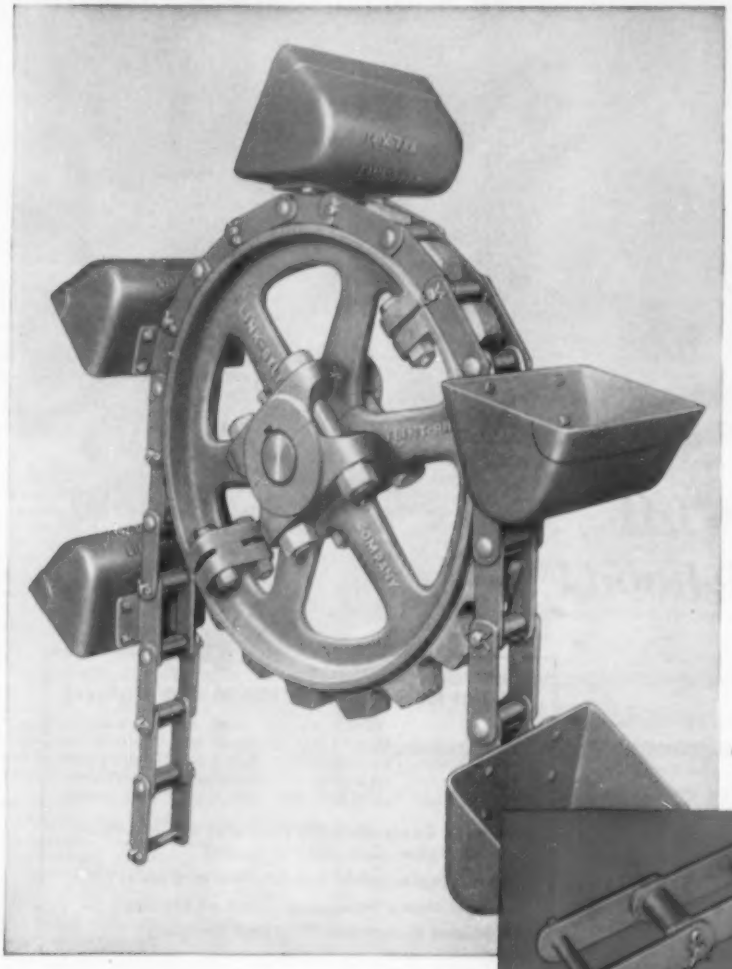
Outside area, dry mill flowsheet of Highland plant



Inside area, dry mill flowsheet

4 times the life... 1/4 the maintenance

through proper selection of LINK-BELT *chain*



Bucket elevator at fertilizer plant proves advantage of choosing from this complete line

Often there's no need to go to excessively costly cast special alloy chains to get long life. Here's proof: In an Indianapolis fertilizer plant, Link-Belt SS-111 bushed chain (left) handled an average of 75,000 to 80,000 tons of fertilizer before requiring replacement. The previous type of chain had to be replaced after handling 18,000 tons.

This installation is an example of the efficiency and economy that can be gained by applying the one chain best suited to specific conditions from the complete Link-Belt line. Remember, no other single source offers you such a broad range of roller, silent, cast, combination, forged and fabricated chains . . . with matching sprockets.

A call to your nearby Link-Belt office or authorized stock-carrying distributor will bring you all the facts about the complete line of Link-Belt chains and sprockets.

Under severely corrosive conditions, Link-Belt SS chain on bucket elevator of this type in fertilizer plant handled 80,000 tons, to previous chain's 18,000.

Looking for the *best* chain for a specific need? Link-Belt makes the *complete* line.

LX5 steel chain

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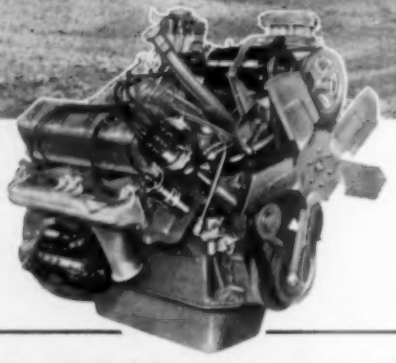

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These new 206, 226, 257 hp. modern truck V-8's in the new INTERNATIONAL V-Line have the "built-in" reserve power that gets your biggest loads moving *fast* . . . the lively response that keeps them rolling with shifting greatly reduced, even on the toughest construction jobs. You save operating costs and you save trip time.

In short, the new INTERNATIONAL V-Line is built to set new highs in your profit column!

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Developed and tested in the lab, then put through more than 1,000,000 test-track miles, and in 2,500,000 on-the-job miles in 39 different truck vocations.

These tests were made by profit-minded truckers with a gimlet-eye on mileage, hauling time and repair bills. Their conclusions—"GREAT, on every count!"

3 Great New INTERNATIONAL V-8 Engines!

	V-401	V-461	V-549
Displacement	400.9 Cu. In.	461 Cu. In.	548.7 Cu. In.
Bore and Stroke	4⅛ x 3¾	4⅛ x 4-5/16	4½ x 4-5/16
Maximum hp.	206 @ 3600	226 @ 3600	257 @ 3400
Maximum Torque	355 @ 1800-2000	420 @ 1600	505 @ 2000

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INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

1 ACTUATOR FOR PLUG AND BALL VALVES — Ledeen Manufacturing Co. has brought out Bulletin 3022, giving complete details and specifications on the Ledeen Quad Actuator, for operating high-pressure plug and ball valves up to 36 in. in size.

2 AIR-COOLED DIESELS — Diesel Energy Corp. has announced the availability of literature and folders describing and illustrating Deutz air-cooled diesel engines.

3 AIR HOSE FITTINGS—Hose Accessories Co. has announced an eight-page bulletin, No. 110, describing and illustrating Le-Hi air hose fittings for mining, tunneling, contracting, quarrying, construction and in industries where compressed air is utilized. Complete data on sizes, parts numbers, etc., are included.

4 ALTERNATING CURRENT METERS — John W. Hobbs Corp. has issued Catalog AC-587, describing and illustrating its line of alternating current meters for 120, 240 and 480 volts, 25, 50 and 60 cycles, available in 10,000-hr. models and in 100,000-hr. models.

5 BELT IDLER—Joy Manufacturing Co. has released Booklet 2-69A, containing design and application data for selection and use of belt conveyors in handling bulk materials. Descriptions, dimensional drawings, specification tables and suggested applications for "Limberoller" idlers and various troughing, impact, training and return brackets to use with belt widths of 18 through 72 in. are included.

6 BITUMINOUS MIX PLANTS — Pioneer Engineering Works, Inc. has published three eight-page bulletins describing its three sizes of Continuflo bituminous mix plants. The bulletins, No. 619A, No. 653A, and No. 658, each have cutaway spreads to illustrate the flow of material through each of the plants, and component parts are described and illustrated for a more comprehensive understanding of the line.

7 CALCITE FLOTATION — Denver Equipment Co. has announced Bulletin M7-F48, describing the beneficiation of calcite by Denver "Sub-A" flotation. The problems in handling lower grade lime ores are discussed, and the various steps in the flowsheet, such as crushing, grinding and desliming are illustrated.

8 CONCRETE BLOCK MANUAL—Columbia Machine has published a comprehensive block manual, illustrating and giving the dimensions of the various shapes, sizes and types of masonry units which can be produced by the company's concrete block machines. Various construction uses of Columbia Machine-produced masonry products are also detailed.

9 CONCRETE FORMS—The Delta Co. has released literature describing the recently introduced Deltaform disposable fiber forms for concrete, designed for forming piers, short columns, column footings or pads.

10 CONCRETE REINFORCING — Adrian Peerless, Inc. has announced a four-page brochure entitled "Use Wal-Lok, It Bonds Better", describing and illustrating the advantages of Wal-Lok reinforcing rods. Test data is given along with typical job photographs.

11 CONTROL VALVES—C. B. Hunt & Son, Inc. has issued Bulletin 561, describing the line of Quick-As-Wink "B"-Type control valves, both air and hydraulic. Design and construction advantages are given, and a line drawing is utilized to further illustrate these advantages.

12 DIESEL-POWERED LIFT TRUCKS—Hyster Co. has brought out literature describing and illustrating diesel powered lift trucks, Models XA-60D, ZA-80D, HC-50D, YC-40D, UC-30D, 150D, 160D, 180D, and 200D. Full specifications are given, as well as complete mechanical descriptions.

13 ELECTRIC GENERATING PLANTS—D. W. Onan & Sons, Inc. has released an eight-page catalog describing the complete line of electric generating plants. Optional accessories available for the units listed are described and illustrated and individual specification sheets for models and information on the Vacu-Flo cooling system are listed.

14 EMPLOYE COMMUNICATIONS—Clarkson Co. has published a booklet describing an employe communications program directed at control of wasted manpower and material. Lithographed in four colors are reproductions of eye-catching posters, bulletins, reminder tabs, etc., that make up the Clarkson plan waste control.

15 EXPLOSION PROOF MOTORS—General Electric Co. has released an eight-page bulletin, No. GEA-6341, discussing the design features and maintenance of its Tri-Clad 55 induction motors, 1 through 30 horsepower, for use in hazardous locations. Illustrations are used to point out the various safety features of the motors.

16 FRICTION POWER TAKE-OFFS — Twin Disc Clutch Co. has announced Bulletin 308, on its complete line of friction power take-offs, designed especially for high-speed, high-output industrial engines. The SP line available includes Models SP-111, SP-114, SP-211, SP-214, SP-314, SP-318 and SP-321, ranging from 95 to 602 hp. in capacity. Horsepower and torque capacities are given, as well as side pull limitations and dimensions for the power take-off clutches.

17 GENERATORS — Caterpillar Tractor Co. has issued Form 31922, entitled "Cat Electric Sets for Power and Protection," showing various uses of its power plants, and giving reasons why they are especially suited to the applications. Actual installations, cutaway drawings and photographs are used to illustrate the 16-page booklet.

18 HANDLING MATERIALS—Mead Board Sales, Inc. has prepared a brochure entitled, "Save with Mead Poke-Pak and Glide-Pak," giving the advantages and economies of these two products in the handling of palletized materials. Typical application photographs are given, and a list of products which may be handled, such as lime, feldspar, and talc, is given.

19 HOISTS—Hercules Steel Products Co. has published Bulletin 164, describing and illustrating Models 330 and 340 hoists in 4 to 6-ton capacities for conversion of ½ to 1-ton pickup, platform or stake body trucks to multi-purpose dump trucks. Hoist construction, operation and controls are described and illustrated, and a capacity table and condensed specifications are also included.

20 IMPELLERS—The Booth Co. has issued Bulletin 563, describing and illustrating rubber covered impellers for extreme abrasion and general mineral acid corrosion operations and petroleum base or coal tar base corrosion and moderate abrasive operations. Dimensional data is listed.

21 LABORATORY FLOTATION MACHINE —The Booth Co. has issued Bulletin 562, illustrating and describing its laboratory flotation machine, listing outstanding features, operation details, its corrosion and abrasion resistance, and specifications.

22 MASONRY BLADES—Clipper Manufacturing Co. has brought out literature on its CBR-500 Series of wet cutting triple-reinforced abrasive blades, which are completely reinforced throughout with Fiberglas webbing. The center of the blade has extra reinforcing, where the strain is greatest.

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23 **MATERIAL FLOW SENSING DEVICES** —Richardson Scale Co. has published Technical Reference 55D, describing automatic sensing devices for indicating a lack of material supply or flow in a handling operation. The three models shown are: material level control, blade no-flow alarm and paddle no-flow alarm. Operation and installation of each device is described in separate sections. Four installation and mounting diagrams are included with three photographs illustrating the units themselves.

24 **MINERAL FLOTATION** — Armour and Co., Chemical Division, has prepared a booklet describing properties, application and advantages of cationic chemicals in flotation. Entitled "Mineral Flotation with Armour Cationic Chemicals," the booklet contains fundamental data on the subject, including the principle of cationic flotation, chemicals used, conditions needed for successful flotation, and inherent advantages in the chemicals.

25 **MOISTURE-PROOFING ADDITIVE** — Pennsylvania Industrial Chemical Corp., has issued a bulletin describing Losorb, an additive for moisture-proofing concrete and cement products. Characteristics and applications are given, and advantages of using the additive in concrete block, mortar and plaster, stucco, concrete farm silos, and industrial concrete are included.

26 **MOTOR DIMENSION DATA — ACEC** Electric Corp. has prepared a technical data sheet with dimensions and reference drawings for ACEC motors in the NEMA standard sizes available. Dimensions are given for the rated motors from one through 30 hp., frame sizes 182 through 326.

27 **OVERHUNG ENGINES**—Euclid Division, General Motors Corp., has issued three catalogs describing the overhung engine line of "Euc" Scrapers, Models S-7, S-12 and S-18. Each of the three-color catalogs contain eight pages of cutaway views of major components and photographs which aid in explaining operating features. Condensed specifications are also included.

28 **POWER TRANSMISSION EQUIPMENT** —Lovejoy Flexible Coupling Co. has prepared a 12-page illustrated technical brochure describing a full line of power transmission equipment, including flexible couplings, variable speed pulleys and transmissions, universal joints and motor bases. Operating data, horsepower ratings, sizes and types for various applications and widely varying working conditions are included.

29 **POWER TRANSMISSION PRODUCTS**—Dodge Manufacturing Corp. has issued an engineering catalog covering the complete line of Dodge mechanical power transmission products. Containing 328 pages, the bulletin gives such information as dimensions, weights, prices, application details, sectional drawings and engineering tables.

30 **PRESTRESSED CONCRETE TANKS** — The Preload Co., Inc. has announced a four-page technical bulletin, No. T-12, describing trends in the design and construction of prestressed concrete tanks, including illustrations of typical tanks and standpipes.

31 **PROCESSING EQUIPMENT**—Farrel-Birmingham Co., Inc. has published a 44-page booklet entitled "This is Farrel-Birmingham," illustrating and describing the company's facilities for manufacturing a variety of heavy machinery and machine tools, and describing its variety of products. The firm's four plants at Ansonia and Derby, Conn., and Buffalo and Rochester, N. Y., are discussed.

32 **REFRACTORIES**—Basic Inc. has issued a 12-page illustrated booklet, No. B-103, entitled "Let's Make Basic Steel," discussing the advantages of basic operation. Probable conversion costs are estimated and operating difficulties and their corrective measures are explained.

33 **STEEL CONVEYOR BELTS**—The Colorado Fuel and Iron Corp. has published a 16-page booklet, entitled "A profitable approach to the selection of steel processing conveyor belts." The Wisco line of standard steel processing belts is discussed, which will handle more than 90 percent of all conveyorized processes requiring plain or stainless steel belts. Complete specifications are given, and a plan for selecting the correct belt for specific needs is included.

34 **THERMOCOUPLES**—Barber-Colman Co., Wheelco Instruments Div., has issued Bulletin F-5228-3, a 40-page booklet, discussing construction and application of thermocouples and radiation detectors used on industrial control applications. Standard thermocouple temperature-millivolt equivalents are also included.

35 **TRACTORS** — Caterpillar Tractor Co. has published Form 31921, entitled "Let's Talk Tractors," featuring the D6, D4 and D2 tractors. Such topics as multiplying work power of a tractor, preventing downtime, cutting operating costs, and preventive maintenance, are discussed. A complete list of attachments is also included.

36 **TRUCK OPERATORS HANDBOOK** — B. F. Goodrich Co. has published a 63-page booklet, with the following chapters: Highway truck tires; Off-the-road tires; Tire care — highway truck tires; Tire care — off-the-road tires; Load and inflation tables; Table of weights and measures; and Other B. F. Goodrich products. Tables and illustrations are included.

37 **TRUCK SIZE, WEIGHT RESTRICTIONS** —Four Wheel Drive Auto Co. has published a 1956-57 Truck and Trailer Size and Weight Restrictions booklet, a pocket-size compilation of the road laws of the 48 states and the District of Columbia. This is the 25th revision of the booklet, and each state's regulations incorporated in the booklet have been checked and authenticated by a responsible highway or motor vehicle official of the state.

38 **UNIVERSAL CYLINDER MOUNTINGS** —Hanna Engineering Works has brought out Bulletin 76, illustrating the use of two types of universal cylinder mountings. Included are dimension tables for cushioned and non-cushioned cylinders, advantages of the mountings, and common applications.

39 **V-8 TRUCK ENGINES** — International Harvester Co. has announced a 16-page booklet giving the design and engineering features of its International V-8 engines. Entitled "New Heavy-Duty V-8 Power Where You Need It Most," the booklet also explains the testing, development and proving program for the engines. A set of testimonial statements is also included.

40 **VOLTAGE REGULATOR** — North American Philips Co., Inc., Instruments Division, has prepared an engineering bulletin, with data on the Norelco 3 Kva. a-c voltage regulator for use with X-ray diffraction equipment. Characteristics are covered, including line voltage, output load, output voltage, output current, regulation, load power factor, harmonic distortion and time constant.

41 **WATER COOLER**—North American Philips Co., Inc., Instruments Division, has brought out a bulletin giving data on a Norelco water cooler for use with X-ray diffraction instruments. The unit described handles installation where water pressure is inadequate and where water temperature is above 70 deg. F. Data is also included on tank volume, water flow, electrical requirements, safety features, cooling capacity, operating pressure, manual and thermostatic controls.

42 **WELDING STEELS**—The Lincoln Electric Co. has revised its "Weldirectory for Mild Steel and Low-Alloy High-Tensile Steels", No. SB-1351, to include the latest iron powder and other electrodes. A description of each electrode is given, as well as its physical properties and chemical composition, recommended welding procedures, an operator's reference table, and a list of typical applications for each electrode.

Detach and Send Us This Post Card

ROCK PRODUCTS, 79 W. Monroe St., Chicago, Ill. (RP 7-56)

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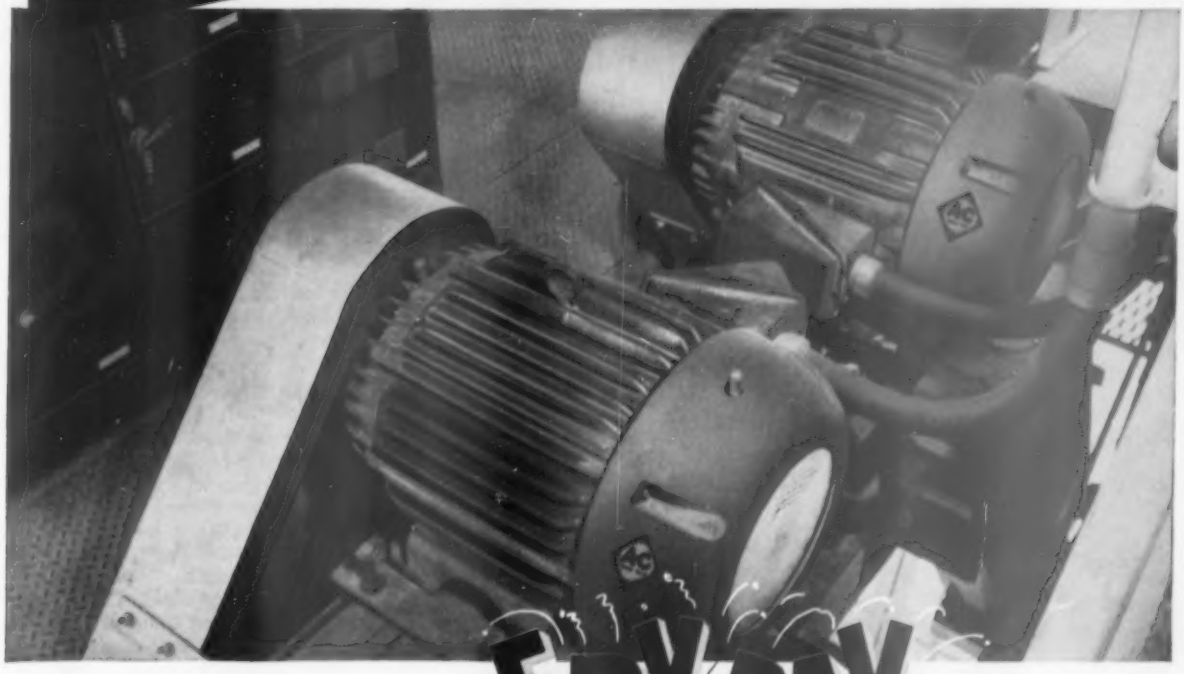
There's **MORE** Cooling Surface in these deep-ribbed **MOTORS**



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● Frying of insulation is impossible under normal conditions with the extra-large cooling surface of Allis-Chalmers rib-type TEFC motors. The result—you expect and get longer motor life.

The engineered partner of A-C motors is Allis-Chalmers control.

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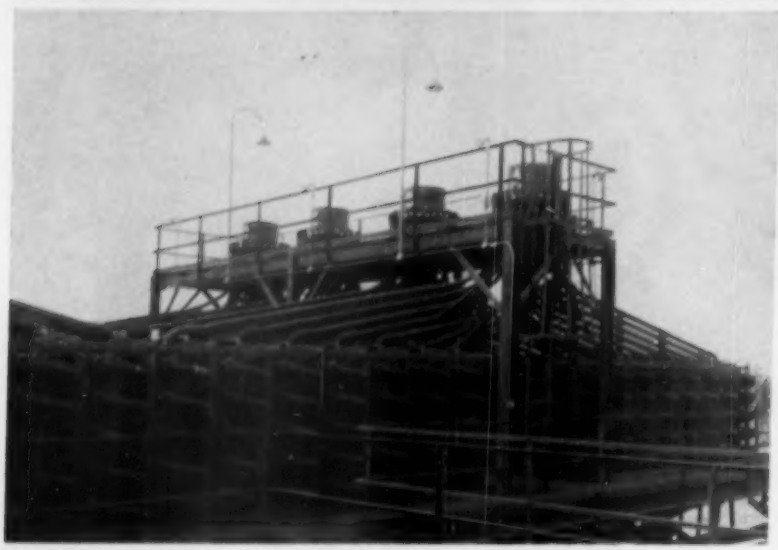

Above: Floating wet plant which is moved to keep within efficient pumping distance of dredge. **Below:** Close-up of 1440 spirals on floating wet plant. Four feeder headers are shown at the top; the five-turn spirals are roughers handling about one ton per hr.

TITANIUM RECOVERY

(Continued from page 96)

Each fraction is delivered via 2½-in. diameter hose to a point just above the two rougher sections.

The feeder head is a vertical 10-in. feed pipe that is inside a cylinder of larger diameter and overflows into it. Around the periphery (base) of the larger cylinder are 30 outlets, each serving a delivery line to the roughers. This method of splitting the feed to the spirals is used throughout the plant, and is said to deliver a uniform feed to each unit.

The use of 1440 Humphrey spirals with pumps and sand de-watering equipment is of particular interest. Equipment is mounted on the deck of the floating wet plant. The Humphrey spiral is a concentrating device used to separate the "heavies" in the beach sand from the matrix.

In the past, "separation" in the sand industry has meant separation by size. In the future, separation also may refer to separation of different mineral components, such as soft particles, coal, and possibly valuable minerals. This is not a drastic departure, for on the West Coast gold has been recovered from sand production for many years. Thus, the Humphrey's spiral as a separating device may be studied with interest. It requires small floor space, has no moving parts, is relatively cheap to install and maintain, and has a capacity comparable with other types of gravity concentrators.

Spirals are arranged in the wet plant in groups classed as roughers, cleaners, and finishing units. The roughers produce a low-grade concentrate that goes to the cleaners. The concentrate from the cleaners is upgraded by the finishing spirals, after which the "heavies" are pumped to the dry plant for further processing, up-grading and separating.

There are 960 roughers in service at the Highland plant. Each receives pulp (30 percent solids) at the rate of from 1 to 1½ t.p.h. Pulp is introduced by gravity at the top of each spiral. As the pulp flows downward in the unit, the heavy minerals tend to collect at the inner edge. Cutters strategically located in the lower areas of the rougher split off and remove the "heavies". If more than one cutter is used, a finished concentrate may be taken from one and low grade concentrates from the remainder. The roughers at Highland take off a concentrate, a middling and a tailing product.

Each spiral in the rougher circuit has five turns. These units contrast with 7-turn spirals at older company plants. The 5-turn type is more efficient. The 7-turn spirals are said to handle a little more tonnage per foot of floor area, and were used at the older plants mainly for that reason. Designers of the Highland plant provided ample room for the more efficient types.

Five-turn spirals are used on the cleaners, but 3-turn spirals are used on the finishers. The spirals are made of cast iron. To add turns, more spirals simply are bolted to the assembly. When the spirals show signs of wear, they can be re-surfaced with a rubber compound that is sprayed onto the metal in multiple layers. Each spiral requires 3 x 3-ft. floor space. The spirals are arranged in two banks of equal number so that there are two distinct plants on the deck.

Tailings or rejects from the plant are pumped via one of the 20-in. rubber lined pumps to a series of settling ponds through 24-in. steel pipe. A Link Belt dragline and an Allis Chalmers HD-15 tractor-dozer keep dikes built up as needed. Sand fractions settle readily in the ponds, but water is still dark colored from organic matter in suspension.

The addition of sulphuric acid near the outlet of one of the ponds makes this water slightly acidic. Such treatment allows the organics to settle, so that a water-clear effluent is discharged into the natural drainage system for the area. Hydrated lime is added to return the effluent to a pH of 7.0. It is fed automatically to the stream by an Omega Machine Co. lime feeder. The system uses a Beckman pH control and a Honeywell pH recorder.

The dry plant ashore receives wet plant concentrates for further processing through a series of Allis-Chalmers rubber-lined pumps. Seven 5 x 4-in. pumps are used. Two primary units are worked in series, and five identical pumps, installed at 1600-ft. intervals in booster stations, complete the facilities. The system handles 45 t.p.h. of solids and 500 g.p.m. of pulp.

The last booster pump delivers to a 48-in. diameter Akins dewatering spiral. Sands from that unit are given a caustic treatment followed by adequate water rinsing. Then, the material is dewatered in a second Akins spiral and products are ground stored by a stacker belt. The caustic treatment is designed to remove organic coatings from the mineral particles for the electrostatic treatment that follows.

The ground stored material is moved, after draining, by a Link Belt

(Continued on page 104)

How to lower the cost of asphalt paving

with Barber-Greene Continuous Plants . . . available in capacities from 20 to more than 200 tons per hour. Built for maximum portability, these plants produce all types of mixes at highest capacity, and for lowest operating cost. Once the proportions are set, operation is automatic; the human element is eliminated and manpower requirements are reduced to a minimum.

with Barber-Greene BatchOmatics . . . available in 2000, 4000 and 6000 pound sizes. Operating on inherently automatic principles, these plants save seconds at every point in the cycle. Instant changeover from automatic operation to manual production of mixes for the drive-in trade . . . instantly reset to preset repetitive cycle operation. New Dyna-Mix pugmill gives faster coating.

with the Barber-Greene Finisher. Having the widest choice of operating speeds, the Barber-Greene Finisher can lay every job at the maximum speed. It provides positive traction, superior maneuverability and unmatched ease of operation. Wide receiving-hopper simplifies truck discharge, eliminates spillage. No other machine paves as permanently, as speedily and as economically.

Write for literature on any plant in the cost-cutting line. Specify capacity. 56-25-AL

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AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

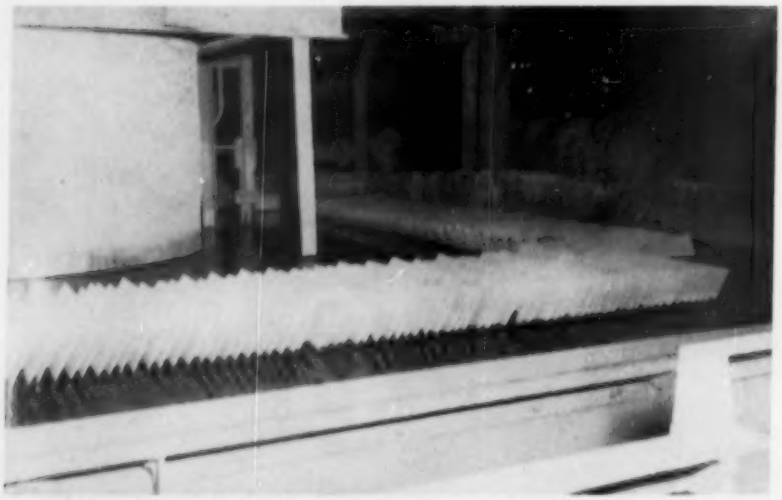

Plate type sand classifier-settling-dewatering unit is one of the wet plant innovations

Speeder clamshell to a steel cylinder that feeds a Hardinge dryer. The thoroughly dried material is then passed through high tension electrostatic separators (roughers, cleaners and finishers). This treatment removes titanium minerals that are then sent to Stearns magnetic separators, and the ilmanite is separated from the rutile. The flow diagram gives the details of the high tension and magnetic separation process.

The high tension electrostatic equipment was supplied by Carpco Manufacturing Inc. J. Hall Carpenter, president of that company, and the staff of Humphreys Gold Corp. pioneered electrostatic and high tension separation at the older Jacksonville, Fla., titanium recovery plant.

The dry plant is of steel construction throughout and the various magnetic units are arranged neatly in the structure. Bucket elevators are used to a great degree in handling the various intermediate and finished products. These are Continental Gin Co. units. The dry plant includes three continuous automatic weighing devices.

The Humphreys Gold Corp. has three operations in Florida, and all produce titanium minerals as the main item. The older operation near Jacksonville was described in the February, 1949, issue of ROCK PRODUCTS, page 102, and the Trail Ridge plant was presented in the December, 1951 issue, page 92.

The Highland plant, similar to the one at Trail Ridge, is owned by E. I. duPont de Nemours & Co., Inc. and is operated under contract by the Humphreys Gold Corp. The plants were designed and built cooperatively by both engineering staffs. Home offices of the Humphreys Gold Corp. are in Denver, Colo. The Florida office for the company is at the Jacksonville plant. Some changes are being made in the Trial Ridge plant and when completed, it and the Highland plant will be interchangeable as regards main items of equipment.

The company controls large blocks of ground in the area. The land is flat, semi-swampy in character. Tractors and dozers, rooters and discs are used to remove the brush and trees. Then, drilling crews move in at the Highland operation and drill 8-in diameter holes on 20-ft. spacing and burden to a 50-ft. depth. Holes are loaded with duPont Nitramon cartridges (4½ x 24-in.) and multiple-hole shots are detonated with milli-second delays and Primacord detonating fuse. The drilling rig has two masts, each supporting jetting pipes through which water is pumped at the rate of 75 g.p.m. at 100 p.s.i. The drilling in the sand is essentially a combination jetting-churning action and the drill crew normally can put down 1000 lineal feet of holes in 8 hr. The basic reason for blasting is to break up the hard pan. The drilling and blasting program costs $7000 to $8000 per month.

The Highland plant is designed to produce 100,000 tons of concentrates per year. It represents an investment of roughly $3 million. Concentrates are shipped in closed hoppers to the company's plants at Baltimore, Md., and at Edgemoor, Del. The titanium materials are made there into titanium metal and titanium dioxide. The latter is used mainly as a pigment.

Jay P. Wood, vice-president of Humphreys Gold Corp., is responsible for all of the company's Florida operations. E. C. Weichel, Jr., is manager of the Trail Ridge and Highland plants. W. J. Siprelle is plant superintendent at Trail Ridge and E. S. Beebe is superintendent at the Highland plant. J. R. Detweiler is technical superintendent of both plants. L. W. Mathews is production superintendent at Highland, W. C. Coran is mine superintendent, John Caldwell is mine supervisor, and Jack McComb is mining foreman. C. G. Denny is employe relations supervisor. Shift foremen are D. B. Page, C. A. Baldree and J. H. Wilber, and B. L. Moxley. L. A. Gray is dry plant superintendent and R. P. Taylor is dry plant supervisor.

Raise Cement Prices

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., has raised third quarter prices 5 to 10-cents a barrel at four middle west locations.

Increases were 5-cents at Mitchell, Ind., and 10-cents at Oglesby, Ill., Mason City, Iowa, Iola, Kans. Lehigh said they had previously raised prices more in other locations and that these increases represented catching up.

Penn-Dixie Cement Corp., New York, N.Y., raised quotations 10-cents a barrel, starting at the same time, in three areas.

Safe Plant

IDEAL CEMENT CO., Denver, Colo., is proud of its Ada operation's 900 days without disabling injury. Dr. J. R. D. Brown, assistant manager, Accident Prevention Bureau, Portland Cement Association, Chicago, Ill., presented a 3½-ton stone monument, a re-award, to the Ada employes for their safety record. Ada is now shooting for the 1000-day safety record held by only 22 plants on the continent.

Annual Lime Production

OPEN-MARKET LIME SALES for 1955 totaled 9,229,832 short tons, up 23 percent over the previous year. The Bureau of Mines Lime Summary for 1955 showed agriculture taking 2.9 percent, building 13.5 percent, chemical and industrial 57.4 percent and refractory 26.2 percent.

Plans Purchase of Deposit

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., plans to purchase a 2000-acre tract of land, for an estimated $200,000, in the Bedford Creek-Camp Mills area near Watertown, N. Y., for future development as a reserve deposit and possibly as the eventual site for a cement plant.

•

SOUTH CAROLINA finds that its nonmetallic mineral receipts have reached an all time high of $18,500,000. Kaolin, cement, crushed stone, sand, gravel, vermiculite and mica rank as major contributors.

Simple rear-dump construction pays off

Construction of the Tournapull Rear-Dump has been radically simplified from that of a conventional heavy-duty hauler. In place of a foundation frame and body sub-frame, Tournapull Rear-Dump hitches rear and front wheels through a horizontal yoke extending back from the kingpin and pivoted to the body itself just above and ahead of the rear wheels. Body is simpler, much stronger . . . has no frame and sub-frame to get out of line.

Look at the photo above . . . note the absence of springs, spring hangars, and tie rods. Low-pressure tires adequately absorb the shocks of rough haul-road travel and high-speed loading. Eliminated are spring maintenance, replacement time and cost of spring parts.

Front wheel drive and kingpin-type steering help simplify Tournapull construction, too. No longer must power be carried back to the rear through a drive-shaft. Bearing and lubricating problems of a long drive-shaft are eliminated. No longer is steering handled by small front wheels subject to misalignment. There are no tie rods, no hinged steering connections to become twisted or bent.

Nor do you have the troubles of hydraulic hoists or gravity dumping with these Rear-Dumps. Dump is by an electric winch that lifts the body up on twin cables. Operation is under complete control at all times, with positive power for dump and return controlled by an electric switch on the dash. There are no oil seals, no high-pressure lines and jacks to keep tight, no freezing up in cold weather as with hydraulics. There are no shock loads as in gravity dumping. You save on regular maintenance time because there is no hoist mechanism to check . . . only a few places to lubricate.

Let us show you how these savings can put money in *your* pocket. For proof, we'll be glad to show you performance figures from a job like yours, or, if you wish, give you names and addresses of owners of Tournapull Rear-Dumps, so you can check for yourself. Call soon.

Tournapull Rear-Dumps Come in Sizes to Fit Your Needs

"D"	"C"	"B"
11 tons	22 tons	35 tons
138 hp	208 hp	293 hp

Prime-movers also power interchangeable scrapers, bottom-dumps, flat-beds, and cranes.

Tournapull—Trademark Reg. U.S. Pat. Off. 8-774-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

RESEARCH

On the Hydraulic Properties of Granulated Blast Furnace Slag

Part II. Studies on the synthetic glassy slags in the system SiO_2-Al_2O_3-CaO reveal new data for cement manufacturers

By TARO TANAKA*

● Recently, the use and the investigation of granulated blast furnace slags in Germany, Belgium and France have been extended to many other countries.

The author has been engaged in the study of this problem since 1949, and hitherto, has investigated the mechanism of Michelsen's test[1], the thermal properties and the heat of crystallization of granulated blast furnace slags.[6, 7, 8, 9] A part of that research was reported in ROCK PRODUCTS, Vol. 54, p. 82-84, July, 1951.

Studies on the synthetic glassy slags in the system SiO_2-Al_2O_3-CaO were described in that article; also the relation between chemical compositions of slags and their hardenability was discussed in detail. The author has reported his original works[10, 11] in Japan [12, 13] since 1950, but presents here the most fundamental and most important theme as his second report.

ALTHOUGH RESEARCH PAPERS ON INDUSTRIAL SLAGS have revealed considerable information about their latent hydraulic properties,[2, 3, 4, 5] these industrial slags inevitably contain so many minor constituents; such as, MgO, FeO, MnO and sulfides, etc., that it is difficult essentially to discuss their chemical and physical properties. Hence, many synthetic slags consisted of the main components; namely SiO_2, Al_2O_3 and CaO, were prepared excluding the influences of the minor constituents and the following tests were wholly carried out with those samples.

Mixes prepared from pure reagents of SiO_2, Al_2O_3 and $CaCO_3$ were melted with an oxyacetylene flame and quenched directly into ice-water. Results of chemical analysis of the melts showed negligibly small differences from their calculated compositions.

To determine the glass content of the melts, observation under the crossed Nicols and Dr. Parker's bromoform method[14] were adopted. The values obtained by both methods were coincided within the error of experiment, except for the melts whose composition existed in the neighboring region of C_3A; considering the results of the above and the previous tests[5], Dr. Parker's bromoform method is preferable to the other.

The glass content and the Zachariasen number of 50 melts are given in Fig. 1 according to their chemical compositions.

It is clearly shown in Fig. 1, that mixes with melting points lower than

*Dr. Eng., director in charge of research, Onoda Cement Co., Ltd., Onoda, Yamaguchi Pref., Japan.

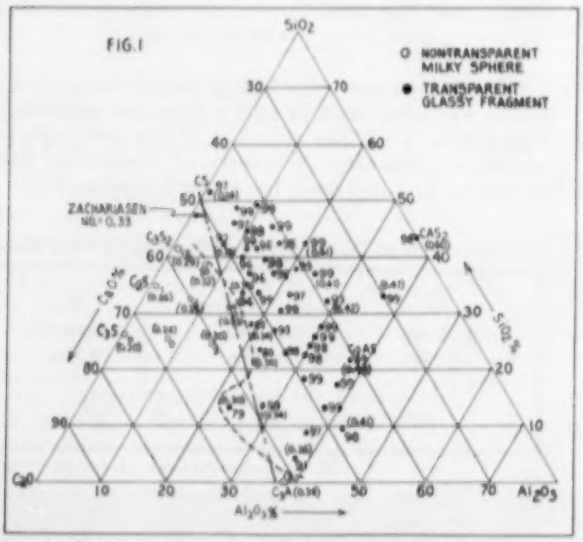

Fig. 1: Glass content and the Zachariasen number (in parenthesis) of the synthetic slags

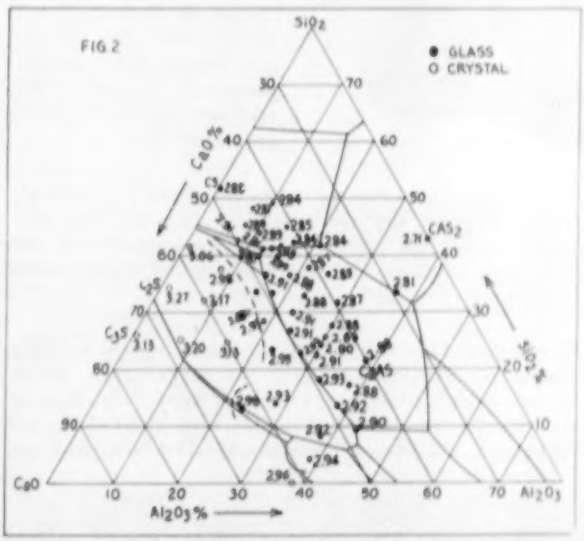

Fig. 2: Determination of specific gravity of 50 synthetic slags

Four work speeds, 1.8 to 6.4 mph, provide the best power and speed for each particular job assignment.

Today's big news in motor graders

is the all-new 60 hp ADAMS "220"

Here is a low-priced grader with big capacity for hard work. Weighing 14,865 pounds, powered by a 60 hp diesel engine, "220" handles many jobs done by larger machines, saves you money on general grading and road maintenance. Big in value, Adams "220" out-works, out-maneuvers any grader in its size and price class.

Works like a big machine

Like the larger Adams machines, the "220" has 4 working speeds under 6.5 mph, and 4 optional "creeper" speeds for full use of engine power in slow, rugged, or precise work. Travels job-to-job up to 18.3 mph.

Blade controls are straight-line-thrust hydraulic. Moldboard swings from ditch-cut to 90° high bank-cut, on either side of grader, in less than a minute, without operator leaving cab. 10-ft. slide-shift moldboard has 6 pitch positions, and reaches 54½" outside wheels. Leaning front wheels, hydraulically operated, offset side thrust, make short turns possible. Wide tread (76" front, 77" rear) gives stability, safety, and easy handling on slopes.

Built like a big machine

"220's" big 10:00 x 24 tires on all six wheels give firm footing and minimum rolling resistance. Sturdy 4-wheel tandem-drive utilizes full engine power, provides push-power and traction for doing many of the heavier jobs. Rugged diesel engine is cranked electrically, starts quickly in all seasons.

Optional cab, open or enclosed type, has 6'4" inside height, floor to ceiling, without use of "foot wells".

Operator controls blade movement from cab, swings moldboard ditch-cut to 90° high bank-cut on either side of grader, in one continuous motion. Exclusive gear assembly multiplies hydraulic ram action, 3 to 1.

Sturdy one-piece, rectangular-welded-section frame, and strong Y-shape drawbar, withstand punishing shocks and stresses. Arched frame provides 17" blade clearance to clear shoulders when climbing out of ditch.

Anti-friction steering, and smooth, fast-acting hydraulic brakes give operator confidence to work or travel at highest practical speed.

Scarifier, power-shift moldboard, 12' moldboards, cab, and other accessories, available as optional equipment.

See Adams in action

We will be glad to prove to you that "220", as well as larger Adams graders, work harder, faster, and at lower cost than other graders of similar size and power. Why not call or write and ask for a competitive demonstration?

Model 220	60 hp	14,865 lbs.
Model 330	80 hp	20,500 lbs.
Model 440	104 hp	21,500 lbs.
Model 550	123 hp	23,500 lbs.
Model 660	150 hp	27,730 lbs.

AG-44-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

1700 deg. C. are almost perfectly glassified, but those higher than 1700 deg. C. contain a considerable quantity of crystal. According to this result, the boundary line between glassified melts and crystallized ones nearly coincides with the line of the Zachariasen number 0.33, except for a melt with the composition of SiO_2 13.6 percent, Al_2O_3 23.1 percent, CaO 63.3 percent, in which the glass content was 79 percent in spite of its low Zachariasen number 0.30.

The specific gravity of the above 50 slags was determined, and the result is given in Fig. 2.

From the test result, it is inferred that there exists the additive property of specific gravity only in the glassy slags as shown in Fig. 3, and that those glassified slags in the system SiO_2-Al_2O_3-CaO also possess one of the characteristic properties of *glass*.

As to the specific gravity of the glassy slags in the triangle C_2AS-CS-CAS_2, the following formula is deduced within the error of 0.4 percent.

$$\text{sp. gr.} = \frac{2.88(C_2AS\ \text{percent}) + 2.88(CS\ \text{percent}) + 0.71(CAS_2\ \text{percent})}{100}$$

The hardenability of the 50 slags was first examined to clarify its relation to the chemical composition; the cement prepared from the slag, the composition of which was of SiO_2 33.81 percent, Al_2O_3 14.70 percent and CaO 51.49 percent, gave the best compressive strength, equal to 95 percent strength value of portland cement added as the activator. Next, in addition to these 50 slags, 27 slags were prepared to examine in detail the previous test result on the compressive strength. In this supplementary test, it was confirmed that the cement prepared from the slag, the composition of which was close to the best one in the previous test was SiO_2 31.82 percent, Al_2O_3 16.58 percent and CaO 51.60 percent. It also had excellent strength value; i.e. 96 percent of the slag with portland cement added. The test result is detailed as follows:

All slags were ground to a fineness of 3000 ± 100 cm^2/g determined by Blaine fineness meter, and blended cements were prepared from 8 parts slag and 2 parts portland cement by weight. The test specimens were cast in a small cylinder (Ø = 1 cm, h = 2 cm) with a 1:1 mortar having a water-cement ratio of 0.45, using Japanese Toyoura standard sand. The compressive strength of the specimens is shown in Fig. 4, (see page 110) in relation to the chemical compositions of the slag contained.

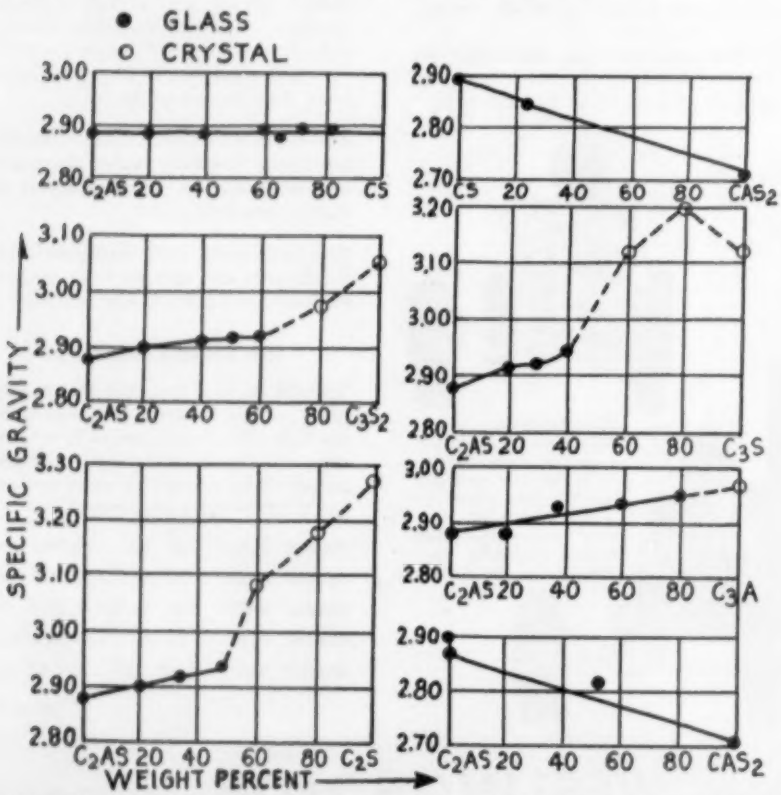
GLASS
CRYSTAL
SPECIFIC GRAVITY
WEIGHT PERCENT
C2AS 20 40 60 80 CS
C2AS 20 40 60 80 CS2
C2AS 20 40 60 80 C3S2
C2AS 20 40 60 80 C3S
C2AS 20 40 60 80 C3A
C2AS 20 40 60 80 C2S
C2AS 20 40 60 80 CAS2

Fig. 3: Relation between chemical compositions of the melts and their specific gravity

The relation between hardenability of the synthetic slags in the system SiO_2-Al_2O_3-CaO and their chemical composition is shown in Fig. 4; (a) it was confirmed that the slags with the composition of CaO 51-52 percent, SiO_2 31-35 percent and Al_2O_3 14-17 percent showed excellent hardenability and the cements consisting chiefly of these slags gave more than 90 percent compressive strength when compared with that of portland cement added. The cements containing the slags with the composition of CaO 50-53 percent, SiO_2 30-38 percent also gave more than 70 percent of portland cement strength; (b) on the other hand, the slags whose compositions lie on the line of C_2AS-C_2S showed remarkably lower hardenability, when activated by portland cement; (c) when SiO_2 content of the slag was decreased to less than 25 percent, however, the hardenability tended to recover gradually, and by further decreasing in SiO_2 content so as to enter the region of aluminous cements, the slag began to show the self-hardening property, and even caused flash-set when activated by portland cement.

Development of compressive strength with regard to the slag compositions in Fig. 4, was very similar to that of the cements prepared from industrial granulated blast furnace slags.

From the test results above mentioned, it can be emphasized that the latent hydraulic property of the granulated blast furnace slag is not based on such chemically definite minerals in equilibrium crystallization as gehlenite, dicalciumsilicate and åkermanite, etc., but on the particular characteristics of the glass phase in the slag. This inference is in agreement with the studies by other investigators[15, 16] at present.

Conclusion

A total of 77 synthetic slags in the ternary system SiO_2-Al_2O_3-CaO were prepared, and their physical and chemical properties were examined in connection with the development of their latent hydraulic properties. The results are summarized as follows:

(1) The melts with the Zachariasen number more than 0.33 were almost perfectly glassified, and with the number less than 0.33 were almost opaque and contained a considerable quantity of minute crystals.

(2) The additive property of specific gravity was confirmed in the glassy slags of the triangle C_2AS-CS-CAS_2.

(3) Information as to the Zachariasen number and the additive property of specific gravity show that glassified slags in the system SiO_2-Al_2O_3-CaO

(Continued on page 110)

DRIVING AND EXTRACTING SHEETING WITH 1200 CFM OF JAEGER AIR:

To lay a 6'6" sewer line in Mount Royal, Quebec, Spino Construction and Equipment Ltd. sheeted more than 2000' of trench 30' deep. An average of 100 piles per day were driven through asphalt and clay by 9B3 hammer operated by Jaeger "600" Rotary compressor. A second Jaeger "600" Rotary operated the E-4 extractor.

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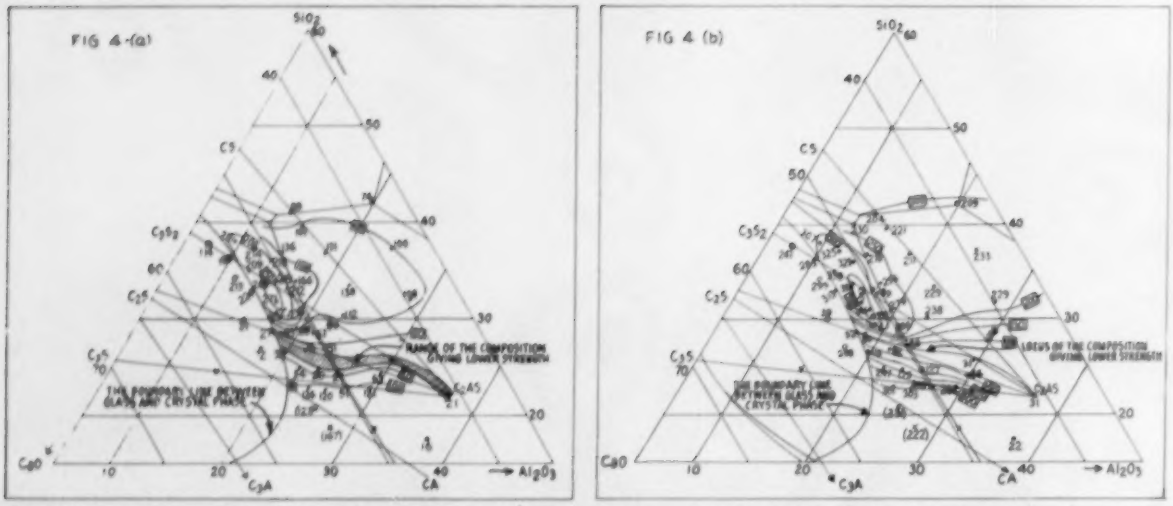

Fig. 4: Compressive strength of the slag-containing cements and the chemical compositions of the slag contained. (Compressive strength of portland cement mortar is 260 and 393 Kg/cm² at 7 and 28 days, respectively.) (a) represents results at 7 days, and (b) at 28 days

possess some of distinctive characteristics of *glass*.

(4) The relation between hardenability of the synthetic slags and their chemical compositions was determined in detail; it is noticeable that the cements prepared from the slags with the composition of CaO. 51-52 percent, SiO_2 31-35 percent and Al_2O_3 14-17 percent gave more than 90 percent compressive strength of the added portland cement; the excellent strength value of 96 percent was developed when the chemical composition of the glassy slag is SiO_2 31.82 percent, Al_2O_3 16.58 percent and CaO 51.60 percent.

(5) According to the test results, the latent hydraulic property of granulated blast furnace slags might be due to the particular characteristics of glass phase in them.

Hardenability of the industrial granulated blast furnace slag could be improved by adjustment of their chemical compositions, with addition of CaO and other minerals, according to the author's chemical composition—hardenability graph.

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(15) F. Keil, Slag Cement, **Third International Symposium of the Chemistry of Cement**, London (1952)

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Study Kansas Limestones

EASTERN KANSAS LIMESTONES, especially those that don't quite make the grade for use as aggregate in road building and for other construction purposes, are up for intensive research by four organizations mutually concerned with problems of limestone utilization. The cooperating agencies include the Kansas Limestone Association, the Kansas State Highway Commission, the Department of Geology at Kansas State College, and the State Geological Survey, which is located at the University of Kansas, Lawrence. The study grew out of an awareness of the declining supply of aggregates in Kansas, and generally in the Midwest, that meet highway-use specifications. The project "came to life" last Fall at meetings called by the Kansas State Highway Commission Research Board and the Kansas Limestone Association.

A threefold objective of the study is to encourage greater utilization of local limestones, including those now rated substandard; to work out methods for processing marginal limestones and "waste" screenings into economic products; and to develop new sources of material. The "program of action" is under the direction of the Special Aggregates Committee of the Kansas State Highway Commission Research Board, headed by R. L. Peyton, engineer of research.

The program got underway in April, when Mr. Peyton, Frank Gilmore, consulting engineer, Kansas Limestone Association, and Russell T. Runnels, chief geochemist, State Geological Survey, obtained samples for laboratory testing from 16 limestone "waste" screening piles throughout eastern Kansas. The screening piles, which represent possible sources of aggregate, constitute an estimated 30 percent of the production from most Kansas quarries.

Samples collected will be analyzed chemically and petrographically, and for their physical properties, in the laboratories of the organizations cooperating on the project. In addition, the correlated program will include a study of methods for beneficiation of screenings or marginal materials for base or subbase construction, and a study of aggregate processing methods.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of May, 1956, were listed by the Portland Cement Association as follows:

	Sq. yd. awarded during May, 1956
Roads	3,872,597
Streets and alleys	3,557,135
Airports	1,083,556
Total	8,513,288

●

AMERICAN SOCIETY FOR TESTING MATERIALS, Philadelphia, Penn., has completed its triennial Book of ASTM Standards. The book has been written in seven parts that are sold separately. Part three contains 477 standards for cement, concrete, ceramics, thermal insulation, road materials, waterproofing and soils.

KAISER ENGINEERS, New York, N. Y., has moved its executive offices to 300 Park Avenue.

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In Canada . . . a 40-R averaged 53.7 feet per drilling hour in shale and igneous rock. Holes were 6¾-in., 39 to 40 feet deep.

In California . . . a 50-R drilling in average and hard rock at owner's limestone quarry averaged 20 feet of 9⅞-in. hole per hour.

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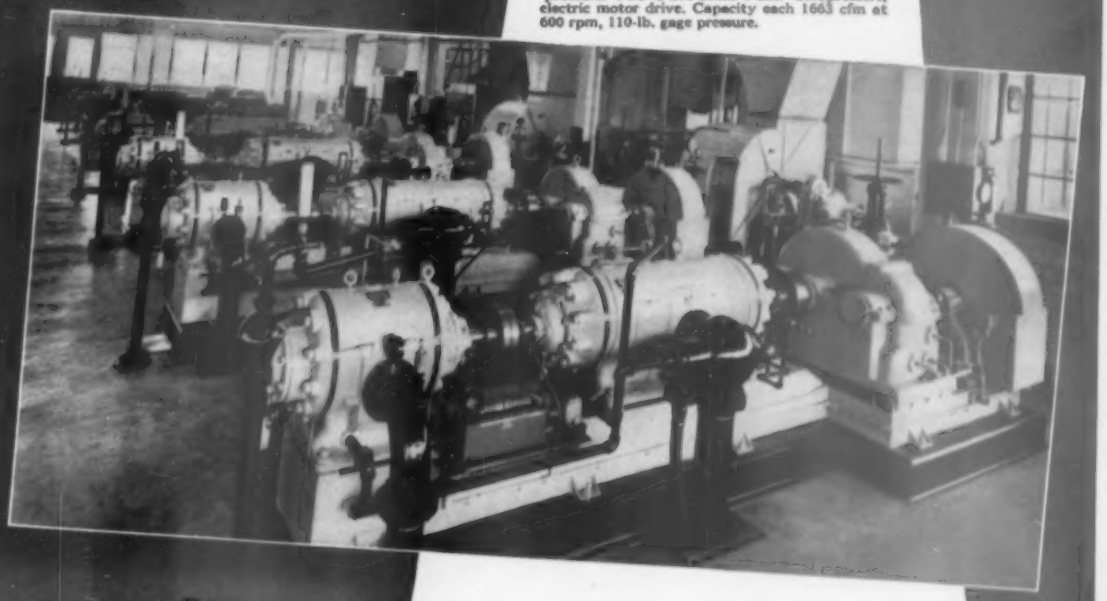

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Labor Relations

(Continued from page 21)

were not worked by the grievant.

"In support of its position the company points out that the contract does not provide for any damages or penalty where an employee is improperly denied an overtime assignment, and that this is so since the remedy is to be found in the equalization provision in accordance with which each employee would be assured of a proportionate amount of available overtime throughout the year. The past practice has been to provide such an aggrieved employee an equal amount of overtime which would not normally have been performed on overtime and that thereby the grievant would be made whole, without depriving any other employee of overtime hours.

"In conclusion, the company contends that it would be inequitable to permit the grievant to refuse the four hours of overtime when offered by the company and to collect pay for hours not worked, at overtime rates. The company feels that it has made a fair, reasonable and equitable offer in line with the terms of the contract, and past practice in the plant, and that therefore, the grievance should be denied.

Opinion of the Arbitrator

"The instant grievance revolves primarily upon a construction of the pertinent contract language and its application to the facts adduced at the hearing. The language of Article V Seniority, Section 7(b), is clear, unambiguous and specific. It provides that where overtime work is required, an available qualified employee in that department is entitled to be offered such work in the first instance. It necessarily follows that if a qualified employee is not available in the department concerned, the company would be authorized to assign the work to an employee in any other department since the contract does not limit or restrict the company's discretion where prior compliance has been had with reference to offering the work to an employee within the department in the first instance.

"However, the contract does not require that such overtime be assigned to a departmental employee where there is an available employee qualified to do the work in any other department throughout the plant on a straight time basis. In such instances the company is privileged to avoid payment of overtime by assigning an employee at the straight time rate.

"While the company is thus authorized to avoid overtime pay in any department, it is precluded from acting in such manner as to result in an evasion of overtime to an available employee within the department qualified to do the required work. Such an employee has preference to overtime work and is protected by the contract language against an invasion of his job or work area by an employee from another department who if assigned would receive overtime pay.

"The contract provision refers to an 'available' employee but does not define the descriptive term nor does it set forth any conditions or test for availability. Is an employee available when he is absent from the plant after he has completed his shift? Is he available when he is not scheduled to work on the day the overtime work is required? In this instance, is he available where he has moved and the company is not informed as to his address or phone number?

"Absent any precise definition of the term by contract language, an arbitrator is required to accord the meaning generally ascribed in ordinary, common and accepted usage. In so doing the object and purpose intended by the parties should be borne in mind and the language should be given a reasonable and practical application. When, and under what circumstances may an employee be deemed to be 'available' in the light of the language of Section 7(b),

"The American College Dictionary defines 'available' as meaning: *'suitable or ready for use; at hand; of use or service; that which may be utilized'*

"Bouvier's Law Dictionary refers to the term thusly: *'capable of being used; suitable to the purpose;'*

"Accordingly it is the opinion of the arbitrator that while no hard and fast rule may be laid down, as applied to this situation, an employee may be deemed to be available if he is on the plant premises, or if he may be contacted at his home or elsewhere through reasonable effort. In general, the company is required to exercise reasonable diligence in contacting and notifying an employee of the availability of overtime work and giving him the first opportunity to reject such work. What would conform to the test of 'reasonable diligence' would depend upon the individual circumstances. An employee who is contacted personally would be expected to promptly indicate whether he would accept the assignment; if he is away from his home when the message is left, he would be expected to contact the company within a reasonable time thereafter depending upon the time when performance of the work would be required.

"In view of the obligation placed upon the company, an employee would be required to cooperate insofar as keeping the employer informed at all times as to his residence and telephone number. If he is absent from his home for any extended period and is desirous of performing such overtime work, he should keep his family, or the company, apprised as to his whereabouts.

"In this case the company has adduced evidence tending to establish that it had not been informed of Johnson's address or phone listing. This evidence stands uncontradicted and on this basis the arbitrator is compelled to hold that the grievant was not 'available' within the terms of the contract, and therefore the request for lost overtime pay must be denied.

"Assuming that the company violated the contract in not offering the work to the grievant, had he been available, would the subsequent offer of overtime work to the grievant rectify the breach under the terms of the 'equalization provision'? The arbitrator thinks not. The right and privilege of performing overtime work is to be exercised at the time it arises and may not be substituted by a later assignment. Article VIII Work Week, Overtime Work and Pay, Section 6, provides that during the year overtime work shall be divided as nearly equal as is practical among qualified employees within each department. This provision is designed to pro-rate the overtime within the department and is not to be construed as providing a saving clause for correcting an improper denial of overtime under Article V Seniority, Section 7(b). These two provisions are separate and distinct, treat of different subject matters, and are completely independent, although relating to the general question of overtime. In brief, the first section provides for assignment of overtime, while the latter deals with equitable distribution of overtime on an annual basis. The fact that the overtime assignment section does not specify any penalty against the company in the case of failure to assign overtime to the proper employee, is of no significance, since the section expressly affords a right, and the remedy in the event of a violation is inherent in the grievance procedure and the arbitrator's authority.

"With reference to alleged past practice, in accordance with which an employee deprived of overtime is given an equal amount of overtime at a later date, such is not controlling, since past practice may not be employed to vary the clear and express language of a contract.

(Continued on page 116)

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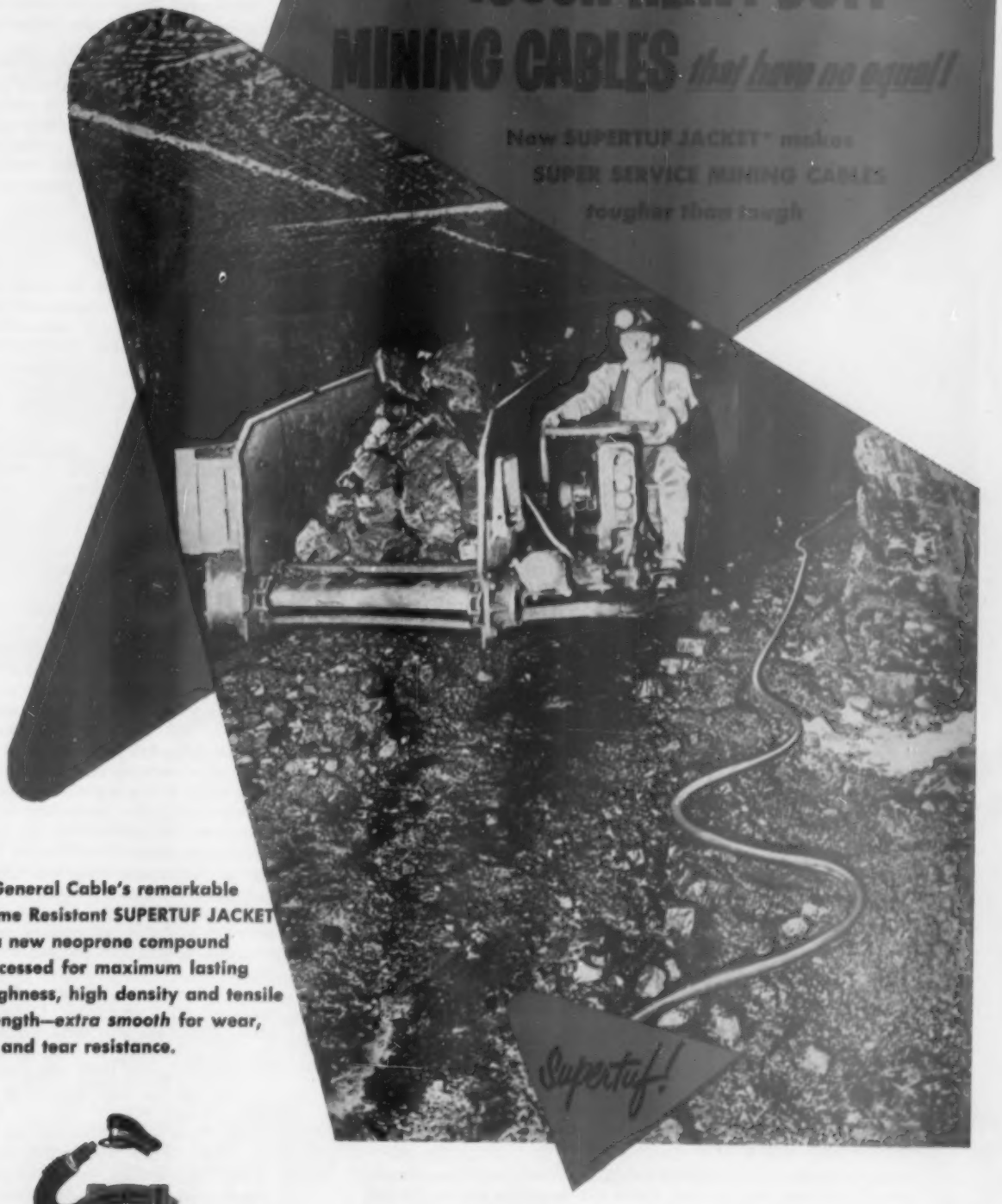

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LABOR RELATIONS

(Continued from 114)

Award

"Based upon the evidence adduced, the arbitrator makes the following award:

"The grievance of employee William Johnson for four hours overtime pay in the Special Department is denied for the reason that the evidence fails to establish that he was available for such overtime work at the time in question and within the meaning of the terms of the contract."

P.C.A. Directors

CHARLES W. REENE has been appointed director of educational services, Portland Cement Association, Chicago, Ill., and Leo H. Corning, formerly director of promotion, has been named director of promotion planning and engineering services. The former position of director of promotion has been divided into the two above positions in a move to broaden responsibility for the Association's expanded promotion program. George H. Paris has been made assistant to the vice-president for promotion. He was formerly assistant director of promotion.

Mr. Reene, formerly advertising and promotion manager for the Hough Manufacturing Corp., Janesville, Wis., returns to the P.C.A. where he served from 1949 to 1953 as assistant to the advertising manager. He was graduated from the University of Illinois, Urbana, Ill., with B.S. and M.S. degrees in advertising and communications and later was a graduate assistant in advertising and promotion at the University. He also has had two years' engineering education at Purdue University, Lafayette, Ind., and Queens College, New York, N.Y. In his new capacity, Mr. Reene will supervise activities in P.C.A. advertising, public relations, publications and educational films.

Mr. Corning, a graduate of Case Institute of Technology, Cleveland, Ohio, joined the structural bureau of the P.C.A. in 1929, was appointed assistant manager in 1935, and manager in 1949. He has been director of promotion since 1952.

Mr. Paris, a graduate of the University of Illinois with a B.S. degree in civil engineering, served as design engineer in the bridge department of the C.B. & Q.R.R. and as an associate editor on railroad publications prior to joining the P.C.A. in 1946 as railway representative for the structural and railways bureau. In 1953 he was appointed assistant director of promotion.

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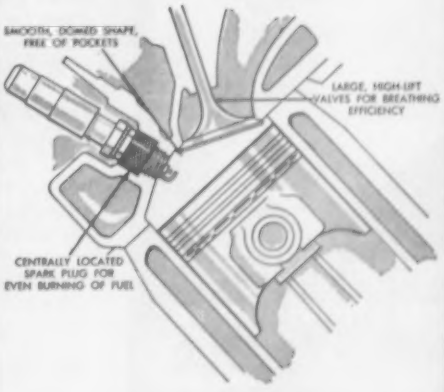
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To Talk on Concrete Curing

WILLIAM J. SHORE, consultant on high pressure steam curing, New York, N. Y., will present a paper on "High Pressure Curing" at the annual meeting of the National Cinder Concrete Products Association to be held at Atlantic City, N. J., July 30 to August 1. Among the topics Mr. Shore will discuss are various trends and tendencies that are showing up in recent high pressure installations; improvement in design of autoclaves and doors; cement economies; use of silica flour and fly ash; new loading ramps; and reuse of condensate and exhaust steam. His paper will also describe the corrosion effect that prevails in some instances, the causes for this, and what steps may be taken to overcome the trouble.

Opens Consulting Office

J. A. GUSTIN, formerly assistant manager and mill superintendent for the Gouverneur Talc Co., Gouverneur, N. Y., subsidiary of the R. T. Vanderbilt Co., has opened his own consulting engineering office, to be known as J. A. Gustin and Associates, Martinsville, Va. He will serve the portland cement, industrial minerals and allied fields in the United States and abroad. Prior to joining Gouverneur Talc Co., Mr. Gustin was assistant general superintendent of the Bessemer Limestone and Cement Co., assistant plant manager and research engineer for Universal Atlas Cement Co., and research engineer with Coplay Cement Manufacturing Co.

Traffic Manager Retires

CHARLES KASDORF has retired as traffic manager of the Hawkeye-Marquette Cement Co., Des Moines, Iowa, after 34 years of service. The announcement was made by G. F. Hetherington, president and sales manager. E. J. Maloy, a 37-year veteran of the company, succeeds Mr. Kasdorf as traffic manager.

U.S. Gypsum Appointments

JOHN A. ROBERTSON, formerly associate research director, has been appointed manager of the research department of United States Gypsum Co., Chicago, Ill. R. E. Muller has been named manager of technical research, and J. H. Crumbaugh has been made manager of structural research and testing.

Vice-President of Operations

IVEN KRABBE, formerly manager of the Brodhead, Penn., plant of the National Portland Cement Co., Philadelphia, Penn., has been elected vice-president in charge of operations.

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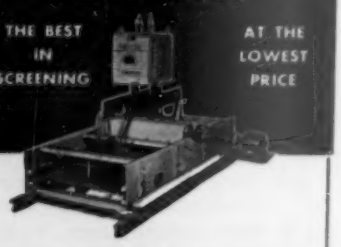


THE MOST MODERN AND EFFICIENT ELECTRIC HEATING EQUIPMENT AT A REASONABLE PRICE

- VIBRATING SCREENS- *All sizes and types*
- UNILEC HEATING EQUIPMENT
- UNIFLEX VIBRATORS
- UNIVIBE RIDDLES

WRITE FOR CATALOG NO. 150

UNIVERSAL VIBRATING SCREEN CO.
Racine, Wisconsin
Quality Screens Since 1919

Why More Hours are Working Hours With Bucyrus-Erie Walking Draglines

Close attention — during manufacture — to the little things that mean outstanding quality — that's one big reason Bucyrus-Erie walking draglines give you the most in actual productive time on your digging or stripping operations. Take the steels Bucyrus-Erie "walkers" are made of, for example. To the naked eye there is very little difference, in comparison with other machines. But a microscopic examination of vital parts would show the many important *little* differences that together make such a *big* difference in performance on the job.

At Bucyrus-Erie, hammer forging, annealing, heat treating, case hardening, and flame hardening — each process is applied where it contributes most to strength, toughness, and hardness. The most modern arc welding is used, plus stress relieving by heat treating, where this will contribute greater strength and longer life.

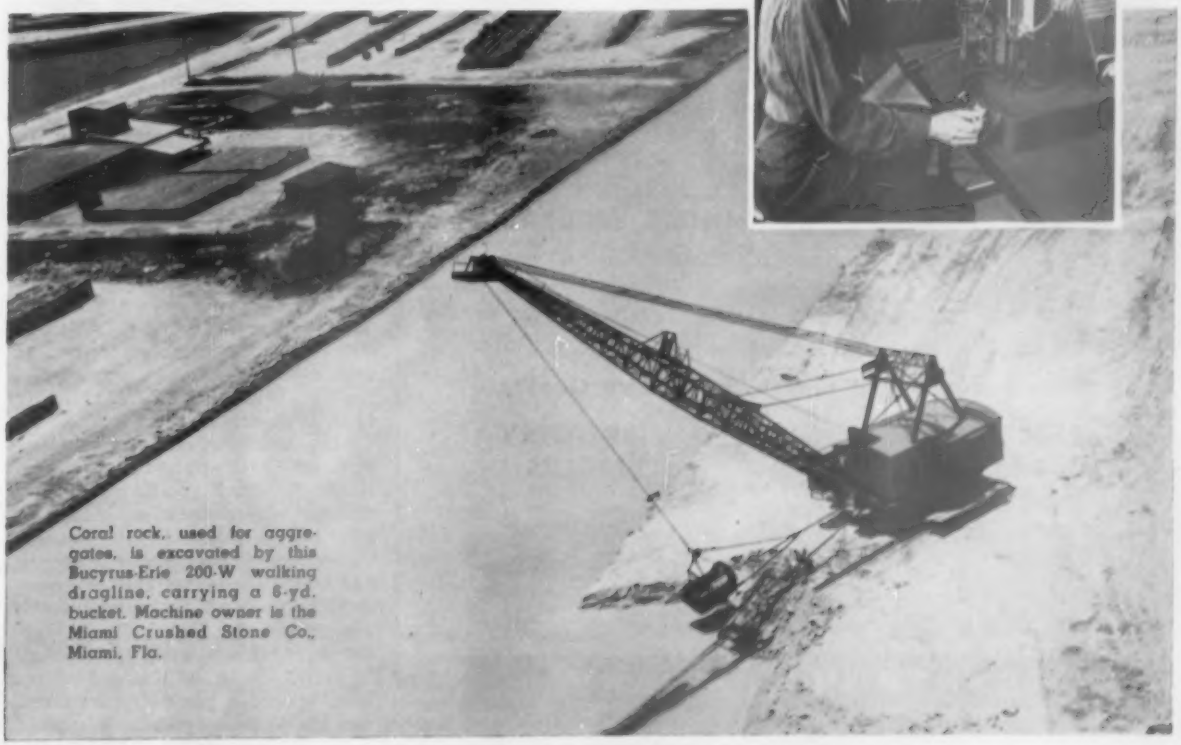
Long-reaching, big-capacity Bucyrus-Erie walking draglines are available in a wide range of sizes to fit your working requirements. Talk over your excavating problems with the Bucyrus-Erie sales representative in your area — he's well qualified to help you select the right machine for your particular needs.

101L56

BUCYRUS ERIE

South Milwaukee, Wis.

A laboratory technician burns chips from a foundry test bar to determine carbon content of the steel. Each heat is triple tested to ensure its meeting specifications.



Coral rock, used for aggregates, is excavated by this Bucyrus-Erie 200-W walking dragline, carrying a 6-yd. bucket. Machine owner is the Miami Crushed Stone Co., Miami, Fla.

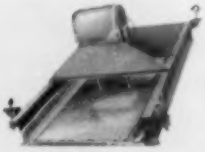
SYNTRON

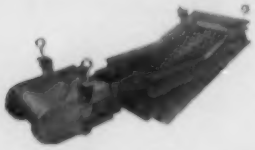
VIBRATING SCREENS

Syntron Vibrating Grizzly Bar Screens will increase the efficiency of any operation requiring scalping or coarse screening—with high speed vibratory material flow and separation and variable control of the material flow. Results are far better separation—elimination of friction and abrasion between material and bars.

PULSATING MAGNET SCREENS

Type "VSF" Electromagnetic Vibrating Screens provide efficient, heavy tonnage scalping or sizing operations in many industries—mining, chemical, etc.





SCREENING FEEDERS

Screening Feeders utilize powerful electromagnetic drives to desize, desludge, dewater, desilt, dedust bulk materials.

Other Equipment of proven dependable Quality.

ELECTRIC VIBRATORS

VIBRATORY FEEDERS

Write for Catalogue Data—FREE

SYNTRON COMPANY

450 Lexington Avenue Homer City, Penna.

NEW GRAVEL PLANT

(Continued from page 66)

made in accordance with the wide range of customer specifications. There are limits of course within the confines of the practical size ranges. "Gradation is important to us", says Mr. Hogeboom, "and we do not have to rely on guess work in this plant."

Full automatic plant control is a design feature that takes plant operation out of human hands as much as possible. There are two control stations: one in the main screening structure and the other at the primary crusher. The former controls the entire operation from the surge pile to the loading-out bins. All operations may be viewed by the operator.

Operations may be controlled from a central push-button either automatically or manually. When on "automatic", each motor is started individually and equipment is interlocked electrically to prevent a material "pile up" due to motor failure or incorrect startup procedure. Also, these plant divisions may be operated independently, if desired: pit and primary crushing; secondary crushing, screening, sand plant and water supply system; rod mill; blending gravel and filling loading out bins; and loading out at bins.

Special built-in electronic aids protect the operation. They include belt brake limit switches, emergency stop switches along the walkway on conveyors, clogged chute switches to stop conveyors if chutes become clogged, "bindicators" in the load-out bins to prevent over loading, and others. An emergency shut-down button stops all motors almost immediately.

The entire plant is designed to start motors in sequence, fully loaded. A flow line is indicated on the push-button control panel to help the operator visualize the operation. At shifts end, all plant equipment is cleared. It takes about 12 minutes to close down the plant, in sequence. Plant motors are 480-volt, except the 300-hp. motor on the water pump is 4000 volt. A dredge may be placed in operation there some day; thus, the high voltage supply. Lighting and control circuits are on 110-volt current.

Main offices of Consumers Company are in Chicago, Illinois, where Harry A. Clark, president, Everett Stumm, vice-president in charge of Pits and Quarries; R. J. Hummel, vice-president and general manager; and C. E. Hogeboom, chief engineer, are headquartered. Operating office is at Crystal Lake, Illinois. R. O. Webster is general superintendent in charge of gravel pits in the Illinois Division. Bill Ledding is plant superintendent, and Les Voltz is resident engineer.

AUSTIN-WESTERN
CRUSHING EQUIPMENT
Engineered for

- HIGH OUTPUT
- CONTINUOUS OPERATION
- MINIMUM MAINTENANCE

Stationary Plant working a slag pile producing railroad ballast.

The Austin-Western line includes Jaw Crushers and Roll Crushers in many sizes; plus matching Screens, Elevators, Conveyors and Bins.

Exclusive design features and high operating speeds increase crusher output. Continuous operation and minimum maintenance expense are assured by the skilled engineering and sound manufacturing that characterize every Austin-Western Crushing and Screening Plant.

Each plant is designed to solve a particular production problem. We would welcome the opportunity to discuss your problem.

See your nearby Austin-Western distributor today . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

15 cu. yd. Portable Bin and Screen Unit, ideal for producing specification material.

61E Portable Plant equipped with 10″ x 24″ Jaw Crusher, 24″ Plate Feeder and 2′ x 6′ double-deck Screen.

201E Portable Plant equipped with 10″ x 24″ Jaw Crusher, 24″ x 16″ Roll Crusher and 3′ x 10′ Screen.

Stationary Plant producing 2 sizes of sand and 2 sizes of washed gravel.

Distributors in Principal Cities of the world

AUSTIN-WESTERN
CRUSHING, SCREENING & WASHING EQUIPMENT

BALDWIN-LIMA-HAMILTON
Construction Equipment Division—Lima Works

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Leavy-Hydropress • Madsen • Pelton • Standard Steel Works

NEW! a cost-cutting drill for the push-button age!

the JOY JUNIOR CHALLENGER

BIG-DRILL FOOTAGE...LOWER LABOR COST...LESS TIME BETWEEN HOLES

Our customers asked for a brute of a drill on a mobile, "push-button" carriage. In other words, they wanted more hole at less labor cost, shorter time between holes, and faster set-ups. Here's our answer: the self-propelled *Joy Junior Challenger* . . . the FIRST COMPLETELY POWER-OPERATED WAGON DRILL ever produced. It drills anywhere, in any position, in any formation. The operator has nothing much to do but think, and change steels. Here are a few of the reasons why the Junior Challenger will cut costs on your job:

ALL POWER OPERATION—All movements of feed, drill, and carriage are hydraulic or air-powered—no chuck wrench necessary.

DRILLS AT ANY ANGLE—Vertical bench hole, toe holes, horizontal holes, and angle holes both up and down from the horizontal.

RIGID ALIGNMENT—Feed is supported by *two* trunnions, will not vibrate or move out of line.

STABILITY—Treads move independently up or down to conform with terrain, then are locked simply by turning a valve.

NEW HEAVY-DUTY 4½" DRIFTER—Has features found on no competitive machine; drills up to 3½" holes to 40 ft. depth *in any formation.*

SECTIONAL STEEL—1¾" round steel system, sectional type with detachable striking bar, has ⅝" o.d. air tube for outstanding hole-cleaning ability.

Write for complete information to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ont.*

SPECIFICATIONS

Easily drills up to 3½" holes to 40 ft. depth in any formation.

Drills horizontal holes to 7½ ft. height.

Write for FREE Bulletin 87-27

Consult a Joy Engineer

for AIR COMPRESSORS • ROCK DRILLS • WAGON DRILLS
CORE DRILLS • BLAST HOLE DRILLS
PORTABLE HOISTS • FANS • BLOWERS • TUNNEL, QUARRY, MINE EQUIPMENT

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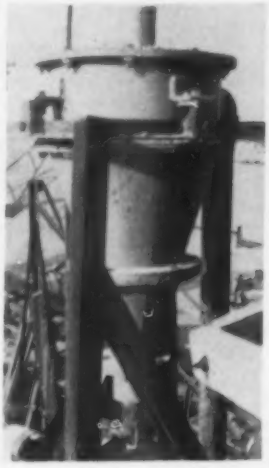
JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS
FOR OVER HALF A CENTURY

WITH MINIMUM CAPITAL INVESTMENT..

15" Duraclone



RECOVERS 3 TONS OF SAND PER HOUR

The Fox Valley Gravel Company plant at Aurora, Illinois, having a deficiency of fine sand, solved their problem by installing 15" Duraclone in the circuit.

Handling a volume of 350 g.p.m. from their classifier overflow, the cone is recovering about 3 tons of clean fines per hour, thus correcting deficiency.

Using a 3" Model X sand pump powered by 10 h.p. motor, the feed is forced to the cone at approx. 1000 r.p.m.

ANALYSIS OF FINE SAND RECOVERY

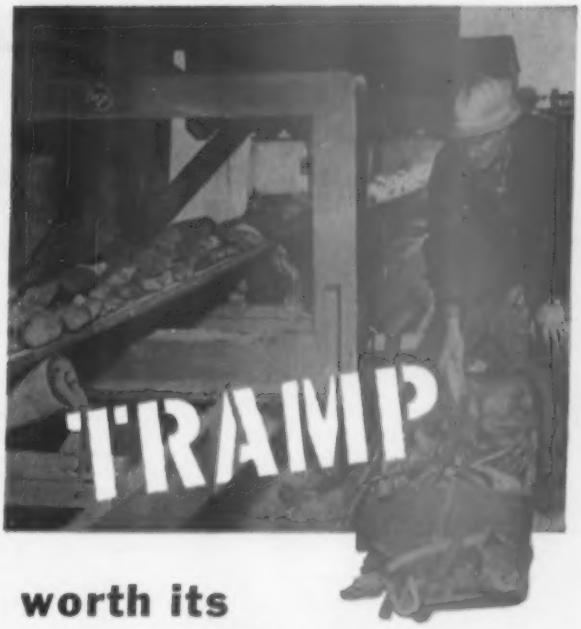
	% RETAINED	% PASSING
30M	7.9	92.1
50M	51.3	48.7
100M	84.6	15.4
200M	97.6	2.4

FOR COMPLETE INFORMATION WRITE TO

H. B. LARGE ENGINEERING COMPANY

267 SO. PARKWOOD AVE. PASADENA, CALIF.

Phone SYcamore- 2-7820



worth its weight in GOLD!

Take a look at this tramp metal the RCA Metal Detector brought to light at the Union Sand and Gravel Company in Spokane, Wash.—Scraper bucket teeth, chain and repair links, tooth adapters, U-bolts, cable clamps, wire rope, iron pieces and assorted nuts and bolts. The metal's value as scrap is nominal, but the potential damage to expensive crushing machinery makes it worth its weight in GOLD! Says Mr. John W. Murphy, partner in this firm, "We surely wouldn't want to run our plant for even five minutes without the Detector."

All kinds of tramp metal—both magnetic and non-magnetic—are discovered automatically by the RCA Metal Detector. Wired to sound an alarm, spray-mark the metal area, or stop the conveyor when trouble threatens, the Detector prevents damage to crushers, pump liners and sizing screens . . . prevents downtime and repairs from cutting into profits . . . quickly pays for itself. Why not find out more about this valuable production aid? Use handy coupon.

Radio Corporation of America
Dept. G-208, Building 15-1, Camden, N.J.
In Canada: RCA VICTOR Company Limited, Montreal

☐ Please send me complete information on the RCA Metal Detector for use in quarrying and mining.

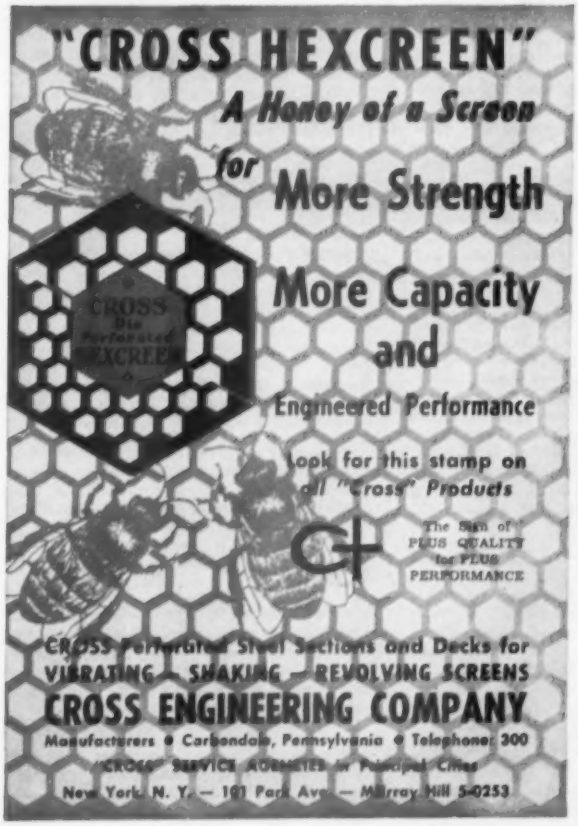
☐ Have RCA field representative contact me.

NAME _____ TITLE _____

COMPANY _____

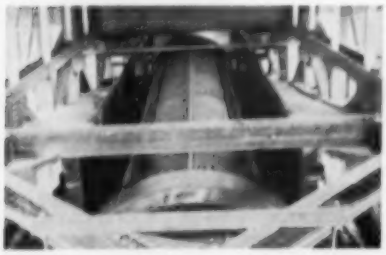
ADDRESS _____

CITY _____ ZONE _____ STATE _____



YUBA

BUCKET LADDER AND HYDRAULIC DREDGES for dredging placer properties, harbor and levee construction, channel changes, production of sand and gravel. Hydraulic dredges from 6-inches up; bucket sizes: 2½ to 18 cu. ft., or larger. Digging depths below water as required.



ABRASION RESISTING STEEL SCREENS —flat or revolving for separating, scrubbing, sizing. Holes taper drilled to prevent clogging. All thicknesses from 3/16" up; other dimensions as needed. Abrasion resisting steel plates available from stock.

DOUBLE-DRUM HOIST, 1,000-ton capacity, built to handle 194-foot digging ladder, typifies heavy equipment Yuba can build for you.

For estimates, send us your drawings or specifications. No obligation.

94

YUBA DREDGES — IMPROVED DEPENDABILITY

YUBA MANUFACTURING CO.

Room 650 • 351 California St. • San Francisco 4, Calif.

MANUFACTURERS NEWS

The Goodyear Tire & Rubber Co., Akron, Ohio, announces that P. W. Litchfield, chairman of the board, has relinquished his duties as chief executive officer to E. J. Thomas, president, who becomes top ranking officer of the company. Mr. Litchfield will continue as chairman of the board and will serve on various management committees. R. S. Wilson has been appointed executive vice-president of sales; P. E. H. Leroy, executive vice-president of finance and accounting, and R. DeYoung, executive vice-president of production, personnel, research and development. New vice-presidents are Victor Holt, Jr., vice-president of the subsidiary sales company in charge of tire renewal sales; L. E. Spencer, assistant to the president; and F. J. Carter, director of personnel.

Union Bag & Paper Corp., New York, N. Y., has announced the following appointments: W. W. Dipman, assistant to S. E. Bradley, vice-president in charge of bag and paper sales; W. E. Eldredge, northeastern district sales manager; R. B. Bennett, southeastern district sales manager; W. A Molzahn, southwestern district sales manager; B. J. O'Hearn, district manager of the Denver area; J. C. Bauman, sales representative in the New Jersey and Pennsylvania sales territory; M. Turner, sales representative in the Georgia-Florida area; and E. N. Corrent, multiwall sales representative in metropolitan New York sales territory.

Thor Power Tool Co., Aurora, Ill., announces construction of a new plant on a 15-acre industrial site in LaGrange Park, Ill., for the Speed-Way Manufacturing Co. division. Erection is expected to be completed early in 1957. Plans have also been made to move the executive administration offices from Aurora, Ill., to the Prudential Building, Chicago, retaining present executive offices in Aurora to maintain supervision of principal administrative departments. The Denver branch office, headed by C. H. Gabriel, manager, has moved to new headquarters at 2704 West 8th Avenue.

The Yale & Towne Mfg. Co., Philadelphia, Penn., has announced the appointment of Garnett A. Vining as western regional sales manager of the materials handling division. He was formerly manager of gas powered industrial truck sales. Harold E. Moon, formerly materials handling salesman and sales executive in the Cincinnati-Dayton-Columbus area, has been named manager of the Cincinnati sales and service branch of the division, and John R. Hogan has been appointed manager of the Cleveland branch of the division.

Borg-Warner Corp., Chicago, Ill., has elected Stephen L. Ingersoll as president and general manager of the Ingersoll steel division. He succeeds H. G. Ingersoll, who has retired. Stephen Ingersoll joined the division in 1920, has served as a vice-president since 1950 and was appointed executive vice-president in 1954. H. G. Ingersoll was vice-president of the division from 1928 to 1950, at which time he was elected president and general manager. He is a vice-president and director of Borg-Warner Corp.

Koppers Co., Inc., Pittsburgh, Penn., announces the promotion of John F. Black to assistant manager of the Freyn department of the engineering and construction division. Formerly manager of continuous casting sales, Mr. Black replaces Fred W. Ryn, who has been named a vice-president of Koppers International, C. A., which was recently formed to handle foreign product sales, overseas plant operations and other activities.

Westinghouse Electric Corp., Pittsburgh, Penn., has announced the appointment of Frank L. Snyder, vice-president, to the staff of A. C. Monteith, vice-president in charge of the apparatus products divisions. John H. Chiles, who has served as engineering manager of the division since 1949, succeeds Mr. Snyder as division manager. M. E. Fagan, Jr., formerly manager of the ordnance department, replaces Mr. Chiles as engineering manager, and Charles H. Chance succeeds C. D. Moore, who has retired, as industrial relations manager.

Fairbanks, Morse & Co., Chicago, Ill., has moved its electronics division from Davenport, Iowa, to East Moline, Ill. Robert H. Morse, III, formerly sales manager, has been elected vice-president of sales; D. L. Harwood, formerly general purchasing agent, has been elected vice-president of purchases; and J. F. Weiffenbach, formerly chief product engineer, has been named director of engineering.

Besser Co., Alpena, Mich., announces the sudden death of Carl Olson, director of material and method service, while enroute to Hanover, Germany, to set up a Besser Vibrapac machine at the German Industrial Fair. He joined the company in 1942 and was widely known through the industry. His son Carl, Jr., a member of the U. S. Armed Forces in Germany, was with him at the time of his death.

Worthington Corp., Harrison, N. J., announces that C. R. Stempf has been appointed manager of the newly created standard products section of the export department. He was formerly special representative in Madrid, Spain. Charles D. Cummins has been appointed district manager of the Seattle office. Formerly assistant district manager, he succeeds E. D. Schively who has accepted a special assignment in the new Canadian operation.

Willson Products, Inc., Reading, Penn., has merged with Ray-O-Vac Co., Madison, Wis., and will now be known as Willson Products Division of the company. Officers of the division are J. C. Ryan, president (also executive vice-president of Ray-O-Vac Co.); T. A. Willson, Sr., vice-president for research and production; and W. C. Weeks, vice-president for sales.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that Donald B. McClelland, Rudolph J. Ramstack and William D. Reuter have been appointed sales representatives in the Detroit, Duluth and Columbus district offices, respectively, of the industries group. Mr. McClelland recently completed the company's training course for graduate engineers. Mr. Ramstack and Mr. Reuter were formerly associated with the processing machinery department.

Marion Power Shovel Co., Marion, Ohio, has announced the following appointments: Walter Pierson, formerly southeastern area sales manager, has been appointed assistant to L. C. Mosley, manager of the mining division. Hugh Lewis, formerly divisional sales manager at Dallas, replaces Mr. Pierson as southeastern area sales manager, with headquarters at Atlanta, Ga., and William Garrison, divisional sales manager, will assist Mr. Lewis.

Williams Patent Crusher & Pulverizer Co., St. Louis, Mo., has acquired the process and feed hammermill business of the old Dixie Machinery Mfg. Co. from W. L. Siegerist of St. Louis, Mo., which was purchased by him in 1955 from Sprout, Waldron & Co., Inc., Muncy, Penn., who purchased it from Bath Iron Works, Bath, Me.

Union Asbestos & Rubber Co., Chicago, Ill., announces the appointment of John F. Corcoran as general manager of the equipment steel products, equipment specialties, coldmobile and hand brake divisions, and Emil T. John as general manager of the fibrous products division. Both are vice-presidents of the company.

Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., announces the appointment of E. H. Kliebenstein Co., Ridgefield, N. J., as distributor in north-

At these TOUGH WEAR points, specify
"THE TOUGHEST STEEL KNOWN"*
Sprockets
Amsco® Manganese Steel sprockets and replaceable rims, hardfaced with Amsco "Economy Hardface C", give 3 to 4 times the life of ordinary sprockets.
Rollers, Idlers
Automatic build-up, then hardfacing with Amsco AW-79 Rod, gives twice the wear of original parts, saves 50% on replacement.
Track Shoes
Manganese Steel construction, with grouser bar integrally cast, and holes counter-sunk so bolts can be re-used. For temporary repair, grouser bar is torch cut and welded to shoe.
End Bits
Corner inserts of Amsco Manganese Steel add extra service life to blade. Amsco HF-40 hardfacing further increases wear resistance.
Scraper Blades
Amsco Manganese Steel gives longer lasting "bite". Amsco HF-40 is ideal for hardfacing.

*AMSCO MANGANESE STEEL . . . plus AMSCO HARDFACING

Shown above are just a few of the "tough wear" points where Amsco products can save you money. Whether for original parts, or for build-up and hardfacing, specify Amsco Manganese Steel and Amsco Hardfacing for maximum operating economy.

We'll be glad to give you full information on Amsco Tractor Parts, Hardfacing Materials or Automatic Welding Machines. Just call your nearby Amsco representative, or write us direct.

OTHER AMSCO PRODUCTS

DIGGING: backhoe buckets—dippers and parts—repointers—dragline bucket parts—dragline chain—sheaves—pinions.

CRUSHING: concaves—mantles—jaw plates—mill liners—hammers.

HANDLING: truck bed liners—grizzly parts—car wheels and liners—sheaves, gears, pinions.

WELDING: automatic and semi-automatic welders—hardfacing rod—manganese plates and shapes.

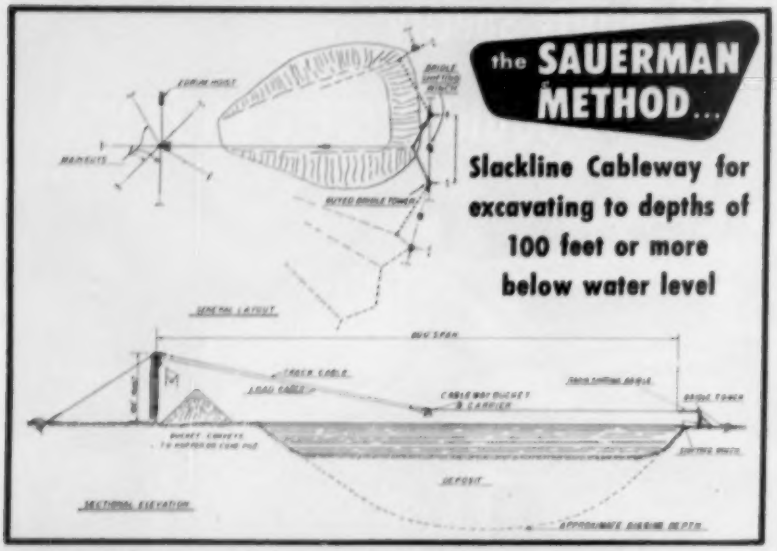
AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

HOW TO GO UNDER WATER AND GET ALL THE MATERIAL FROM YOUR DEPOSIT


the SAUERMAN METHOD...
Slackline Cableway for excavating to depths of 100 feet or more below water level
SECTIONAL ELEVATION
DEPOSIT

Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridle is not needed for many deposits.

Cableway at Cabinet Gorge Dam digs and hauls from tailrace 1000 ft. away. (Full details in Sauerman News No. 143.)

New York gravel producer switched to cableway for underwater operation of his pit. Average haul is 600 ft. from a 50-ft. depth (Sauerman News No. 141).

Deposits below water yield new profits with a long reaching Sauerman Slackline Cableway. On job after job this machine has proved to be the most efficient for this type of operation. It is especially effective where the material to be excavated has good depth and will flow to the bottom of the cut. For shallow deposits or non-caving material a rapid shifting device is used to change the line of operation.

One man controlling the hoist digs, conveys and elevates from deposit to plant over spans of 1000 ft. or more . . . across streams, lakes, bogs or deep pits. The powerful load line pull insures digging penetration. Tensioning the track cable lifts the bucket which is inhauled at high speed and dumps automatically. Gravity return completes the fast operating cycle. Bucket capacities range from ⅓ to 3½ cu. yds.

To get fast, economical long range excavation, and the shortest, most direct way from pit to pile use a slackline cableway. Contact Sauerman for specific recommendations. No obligation. Request Catalog C, showing detailed specifications and photos of slackline cableways in action on all types of deep digging jobs.

SAUERMAN BROS. INC.

630 S. 28th AVE. | BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

ern New Jersey and southeastern New York State. A new Wooldridge factory parts warehouse has been opened in Perth Amboy, N. J., under the direction of Anthony Zulkowski. H. R. Patterson is district sales manager for the North Atlantic states territory.

Chain Belt Co., Milwaukee, Wis., has announced the appointment of J. W. Snavely as assistant manager of the conveyor and process equipment division in addition to his duties as manager of conveyor sales. He has been with the company since 1927. B. G. Schneider, formerly chief engineer for conveyor equipment, has been named chief engineer of the conveyor and process equipment division.

Richardson Scale Co., Clifton, N. J., announces formation of a new company in England, Richardson Scale Co., Ltd., Nottingham, England, to manufacture and market Richardson automatic scales and proportioning equipment in the United Kingdom, the Commonwealth nations and the Sterling area. J. E. Dewstow is managing director of the new firm, and T. A. Shore is technical director.

Gardner-Denver Co., Quincy, Ill., announces that William B. Knoderer has been appointed sales manager of the industrial division, and Niel Martin Fishback has been named sales manager of the mining and contracting division. Mr. Knoderer was sales manager of Keller Tool Co. before it merged with Gardner-Denver. Mr. Fishback formerly served as district manager of the El Paso branch.

Western Precipitation Corp., Los Angeles, Calif., announces the promotion of H. B. Alford from chief service engineer to chief field engineer, responsible for all service, construction and inspection operations throughout the United States and Canada, with headquarters in Los Angeles.

Sand Pump Co. (formerly Krogh Pump & Equipment Co.,) San Francisco, Calif., has sold its business and tangible assets to a new buyer corporation known as the Krogh Pump & Equipment Co., Inc., which will continue the business at 515 Harrison St., San Francisco, Calif., according to an announcement by Morris Rhine, president of the Sand Pump Co.

Cummins Engine Co., Inc., Columbus, Ind., has announced a $6,000,000 capital program for 1956 which will include construction of a 73,000-sq. ft. addition to its manufacturing plant. Upon completion, the company will have spent $17,300,000 on capital additions since 1951.

H. K. Porter Co., Inc., Pittsburgh, Penn., has elected Charles L. Holbert as a vice-president. He was formerly executive vice-president of the Southern Pacific Milling Co., Ventura, Calif. Prior to that he was vice-president and general manager of the Johnston Pump Co.

The Patterson Foundry & Machine Co., East Liverpool, Ohio, announces that Richard D. Darrah has been named vice-president and sales manager. He was formerly sales manager of the industrial conditioning division of Dravo Corp.

Brunner & Lay, Inc., Franklin Park, Ill., announces a $1,000,000 expansion program including new plant location, new plant at existing site, building additions and purchase of additional production equipment.

"Quick-Way" Truck Shovel Co., Denver, Colo., has announced the election of Clinton D. St. Clair as president of the company, a subsidiary of the Penn-Texas Corp., of which Mr. St. Clair is vice-president in charge of manufacturing.

Hyster Co., Portland, Ore., has announced the promotion of Raymond L. Howerton to assistant manager of the sales promotion department. He was formerly manager of the sales

the A&S

tilted valve bag*

*Licensed under pending patent application.

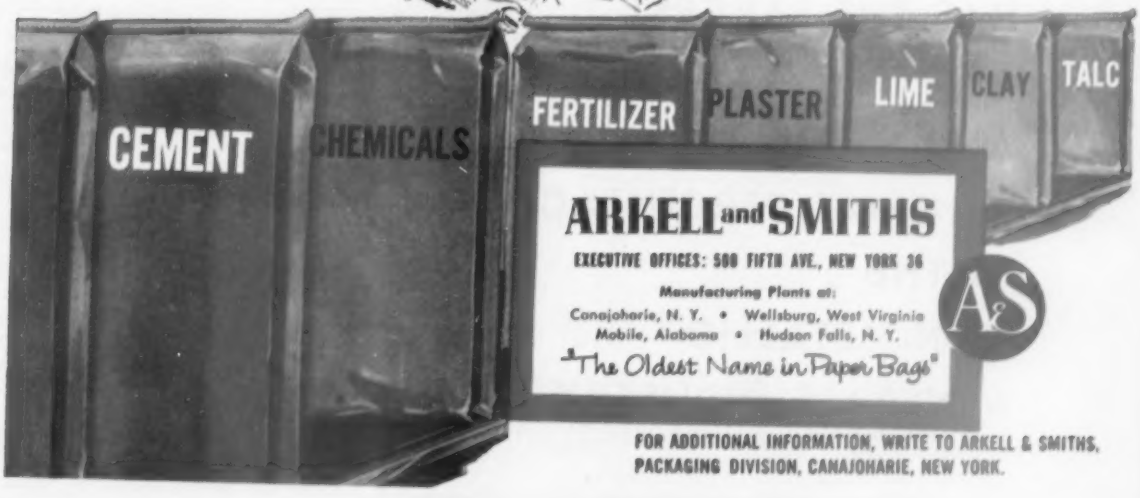
A NEW DEVELOPMENT FOR ROCK PRODUCTS!

The A & S Tilted Valve Bag is a must for manufacturers of lime, plaster, clays, cement and similar products. With the Tilted Valve, these bags are faster to put on the filling spout and are self-sealing in the true sense of the word . . . as the product reaches the top of the bag, the valve is automatically pinched shut to form a more positive, sift-proof seal — far more efficient than previous designs of this type.

The Tilted Valve can be furnished on any sewn valve multiwall bag, and what's more, there is no upcharge for bags with this improvement!

Arkell & Smiths multiwall bags are outstanding in design and printed in sparkling inks and have long been a favorite for shipping finely divided materials, both inert and hygroscopic. This new "Tilted Valve" feature is just one more reason why thrifty packers buy from A & S.

Let A & S take over your packaging problem today!



FOR ADDITIONAL INFORMATION, WRITE TO ARKELL & SMITHS, PACKAGING DIVISION, CANAJOHARIE, NEW YORK.

MECKUM *Material Handling Pumps*

★ Low initial & operating cost.

★ Engineered individually for hydraulic efficiency and simplicity of maintenance.

★ All wearing parts made of alloys to suit various types of materials pumped.

★ Ease of assembly of replacement parts reduces shut down time.

Another progressively engineered product. In sizes from 4" to 30".

Also manufacturers and suppliers of complete dredges, pipe, fittings and equipment necessary to efficient production of materials.

Write us for details or nearest installation.

MECKUM ENGINEERING, INC.

53 W. Jackson Blvd., Chicago 4, Ill. Dayton Road, Ottawa, Ill.

ROCK PRODUCTS

HAS THE LARGEST ABC CIRCULATION AND HIGHEST RENEWAL PERCENTAGE IN THE NON-METALLIC MINERALS INDUSTRY

training division of the department. Announcement has also been made of erection of a 25,000-sq. ft. addition to the Peoria plant, completion of which is scheduled for November of this year.

Caterpillar Tractor Co., Peoria, Ill., recently dedicated its new Decatur, Ill., motor grader and wheel-type tractor plant, which was designed specifically for the manufacture of this type of equipment. The two main buildings provide more than 840,000 sq. ft. of manufacturing and office space. Construction of the new plant releases facilities at the Peoria plant for the added production of crawler tractors and diesel engines. Open house was held for five days and was attended by L. B. Neumiller, chairman of the board, Gov. William Stratton of Illinois and other civic officials. Officers of the company who spoke at the dedication ceremonies were Harmon S. Eberhard, president; C. A. Woodley, vice-president; L. L. Morgan, manager of sales development division; W. S. Zeigler, manager of domestic sales; and Warren Kinsey, manager of the Decatur plant.

Harmon S. Eberhard

Continental Gin Co., Birmingham, Ala., announces consolidation of the special products division and industrial division into the industrial division under the direction of George C. Morgan, manager. Ralph Y. MacIntyre, formerly manager of the industrial division, has been appointed manager of sales development.

Gar Wood Industries, Inc., Wayne, Mich., has announced that the Gar Wood factory branch in Chicago has been sold to J. A. Sloan, formerly district manager of the Mack Motor Co. factory branch in Omaha, Neb. The new firm will be known as Gar Wood Chicago Truck Equipment, Inc.

Milwaukee Crane & Service Co., Cudahy, Wis., announces that all capital stock of the company has been purchased by Industrial Enterprises, Inc., New York, N. Y. Clarence Nissen, founder of Milwaukee Crane, will continue as president and general manager.

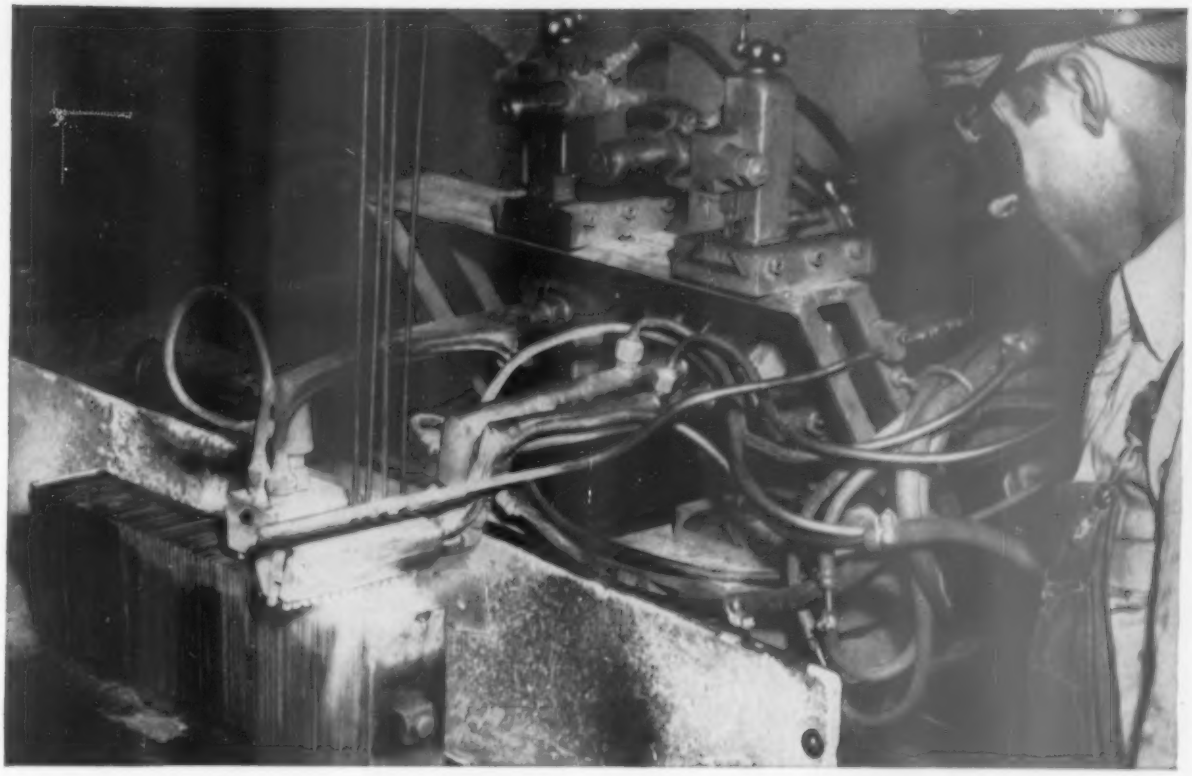
Stulz-Sickles Co., Newark, N. J., announces construction of a new plant and offices at Elizabeth, N. J., completion of which is scheduled for September, 1956. All operations now carried on at the Newark plant will be transferred to the new location.

Drott Tractor Co., Inc., Milwaukee, Wis., announces the sudden death on April 5 of E. A. Drott, founder, while delivering a talk before a group of International Harvester Co. distributors in Raleigh, N. C.

Harnischfeger Corp., Milwaukee, Wis., announces the appointment of Charles F. Parthum as advertising and sales promotion manager. He was formerly with The Buchen Co., Chicago, Ill.

Correction

IN THE ARTICLE, "Complete New Silica Refractory Plant," appearing in Rock Products, November, 1955, page 77, the subhead referred to the new Leslie, Md., plant of Harbison-Walker Refractories Co., as its third silica brick works. This should have been referred to as the third silica brick plant built since the introduction of the Vega brand. Actually, the company has in operation ten silica brick plants throughout the United States.



Hammer Life Increased Four Times by HARD-FACING

Hard-facing with HAYSTELLITE tube rod has increased the life of hammers used in a heavy duty grinder by four times. The hammers rotate at from 3000 to 3600 revolutions per minute while pulverizing limestone, mica and other severe abrasives. They are hard-faced mechanically on a model 800 straight-line machine. Seventy hammers are processed at a time, and 1000 hammers are hard-faced in a normal working day.

HAYSTELLITE rod, the hard-facing material used on the hammers, forms an extremely hard surface that has good resistance to impact. It produces a deposit of sharp, irregularly shaped particles of cast tungsten carbide evenly distributed in a matrix of tough steel. The tungsten carbide particles resist abrasion, and the steel matrix cushions the effects of sudden shock.

There are 18 HAYNES hard-facing alloys . . . a wide selection that guarantees you the right rod at the right price for every wear problem. These hard-facing rods have achieved excellent results in the earth moving and quarrying industries when used to protect such parts as cable drums, hammers, crusher rolls, bucket teeth, and conveying screws. They can be the economical answer to your wear problems too.

Ask your local HAYNES STELLITE dealer for a copy of "HAYNES Hard-Facing Manual." It contains descriptive information and application data on the complete line of HAYNES hard-facing alloys. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

See... Your local Haynes Stellite Dealer

or

Write... to Haynes Stellite Company

"Haynes", "Haynes Stellite", and "Haystellite" are registered trade-marks of Union Carbide and Carbon Corporation.

BITES DEEPER DUMPS FASTER

PROMPT SERVICE AVAILABLE

Factory service on Kiesler Buckets and as an accommodation on other makes, too. Whatever the problem, feel free to call on us.

Whether you need to rehandle or excavate, you will move MORE IN LESS TIME with a KIESLER CLAM SHELL. Our guarantee (see below) is the result of decades of experimentation and factual impartial testing; using proven principles of leverage and power and applying that power and leverage to both shells the KIESLER CLAM SHELL has more DIGGING-IN ability than any other bucket manufactured. And this digging ability is not dependent on dead weight (counterweights) nor large amounts of cable, hence longer cable life.

Note, too, how little KIESLER shells have to be opened to dump whole load: no "tailing-off" with a KIESLER. This is CONTROLLED DUMPING!

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.

KIESLER Since 1892

944 W. HURON ST. • CHICAGO 22, ILL. • MONROE 6-7144

FINANCIAL

RECENT DIVIDENDS

Alpha Portland Cement Co.		0.37½	6-9
American-Marietta Co.	Q	0.30	5-1
	Pf.	1.25	5-1
Bessemer Limestone & Cement Co.	Q	0.50	6-12
	Pf.	0.50	7-2
Calaveras Cement Co.	Q	0.25	5-15
Canada Cement, Ltd.	Pf. Q	0.32½	6-20
Colonial Sand & Stone Co., Inc.	Q	0.07½	6-29
Consolidated Cement Corp.	Q	0.20	6-30
General Portland Cement Co.	Q	0.45	6-30
Lehigh Portland Cement Co.	Q	0.25	6-1
Missouri Portland Cement Co.	Q	0.50	5-9
Potash Co. of America	Q	0.45	6-1
Santa Cruz Portland Cement Co.	2nd Liq.	120.00	3-27
Texas Industries, Inc.	Q	0.10	4-30
Warner Co.	Q	0.50	4-14

NATIONAL GYPSUM CO., Buffalo, N. Y., reported net sales of $39,509,051 for the first three months of 1956, an increase of 18 percent over $33,572,033 for the first quarter of 1955. Net earnings for the first quarter of 1956 increased 28 percent, amounting to $4,577,694, or $1.34 per share on 3,322,541 shares, compared with $3,574,098, or $1.24 a share on 2,784,627 shares for the first quarter of 1955.

INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago, Ill., reports net sales for the nine months ended March 31, 1956, were $66,203,844, a decrease of 5 percent from $69,388,264 for the nine months a year earlier. Net profits amounted to $3,030,240, or $1.17 a share of common stock, compared with $4,387,312 for the corresponding nine months of the previous year, or $1.76 per share of common stock.

NEW ENGLAND LIME CO., Adams, Mass., lists the following report of income for the three months ended March 31:

	1956	1955
Net sales, etc.	$612,476	$588,442
Costs & expenses	502,804	469,697
Net earnings	109,672	118,745
Fixed charges	28,921	31,737
Income taxes	24,225	26,102
Nelco Metals prof.	10,554	12,717
Net profit	67,079	73,622
Earn., com. share	$0.32	$1.06
No. of com. shares	208,866	69,622

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., has announced the following statement of income for the quarters ended March 31:

	1956	1955
Sales	$5,941,313	$6,319,552
Net before taxes	997,818	1,349,106
Income taxes	518,109	700,782
Net profit	479,709	648,324
Earned per com shr	.17	.25
Common shares	2,625,000	2,375,000

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., reports the following account of earnings for the quarters ended March 31:

	1956	1955
Sales	$11,920,479	$12,005,167
Profit before tax	2,797,840	2,579,354
Net profit after tax	1,537,840	1,414,354
Earned per share	.81	.74
Capital shares	1,901,560	1,901,560

Your Wickwire Rope distributor and our steel melter... always at your service

This steel melter—at Wickwire's open hearths where wire rope steel is made—is with your Wickwire Rope Distributor every time he makes a call.

True, he's physically at the open hearth compounding steel with the sharp eye of an expert. But your Wickwire Distributor makes his call with the full assurance that the steel in Wickwire Rope has the right chemical content and grain size because it's always produced under rigidly controlled conditions by experts.

It's just one more reason why your Wickwire Rope Distributor knows he's got top-quality rope, slings and strand to sell ... and that these products will serve you well.

CF&I WICKWIRE ROPE A CF&I PRODUCT

4082

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

Hendrick H Means High Quality for Quarries

Hendrick—Pioneer Perforator of Special Quality Steels for 80 Years

Take Hendrick's 80 years of experience in selecting and specifying the best analyses of steel for the crushed stone industry. Add to it Hendrick's 80 years of experience in perforating plate for vibrating screens and you end up with a combination that can't be beaten.

That's why Hendrick Perforated Plate stands up longer and affords more accurate sizing. No other screening medium can compare to it for uniformity of mesh, for non-blending clearance and for long, trouble-free service life. Hendrick perforated *H* quality steel is supplied in any desired size or shape of openings. It can also be furnished flat or corrugated. Write for details.

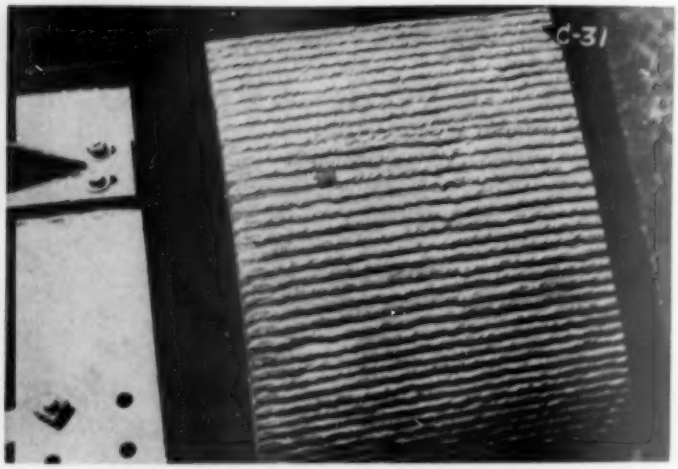
Hendrick
MANUFACTURING COMPANY
47 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot and Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hendrick Hydro-Dehazer

RESISTO-LOY *reduces excessive maintenance costs on CRUSHER ROLLS*

In the use of RESISTO-LOY on manganese crusher rolls, the old rule applies — "It's not the first cost, but the upkeep that counts." If you are crushing large tonnages of hard materials daily, and if you are forced to maintain the rolls constantly, we can put a stop to the excessive costs of such maintenance. In the American way, the good old competitive way, we can be sure of one thing—"we get just what we pay for."

Regardless of price, we invite you to prove that statement to your own complete satisfaction. Good things DO cost more, and if you want the satisfaction obtainable from a composition of the finest metals available, then you can get this satisfaction from RESISTO-LOY.



The above illustration shows the correct application of RESISTO-LOY to produce ¾" minus materials. This is a job your plant welder can efficiently handle. Call in our Field Man. Let him show you how to cut maintenance costs on your rolls. He is a Specialist. You can count on his advice and recommendations.

THE RESISTO-LOY CO. INC., Grand Rapids 7, Michigan

A FULLY AIR-CONTROLLED 1¼-YD. MACHINE

THE NEW LORAIN-56

1¼-YD. SHOVEL

25-TON CRANE
(as fully convertible machine)

30-TON CRANE
(as heavy-duty lifting Crane on extra-wide crawlers)

ALL OF THESE FEATURES
AND MANY MORE
ARE STANDARD

2 LEVER "METERED" AIR OPERATION

Easier! Faster! Simpler! Uses only 2 levers to apply "Air-Ease" power to all turntable operations. A new concept in fingertip control. Retains full "feel" of machine.

"SHEAR BALL" MOUNTING

No centerpin or nut, no rollers to wear. No adjustments! Provides smooth, rock-steady, "ball bearing" swing. Nothing else like it on any other make of shovel-crane.

SQUARE-TUBULAR-CHORD CRANE BOOM

Lighter! Longer! Stronger! New, patent-applied-for design gives greater strength, less weight. Permits increased lifting capacities and working with longer booms.

TORQUE CONVERTER

Gives the smoothest, most productive power take-off that can be had. Multiplies engine torque. Effectively absorbs digging shocks and strains. No-stall, "never-say-die" power hangs on—maximum work obtained from the diesel engine.

ANTI-FRICTION BEARINGS

Now, anti-friction bearings on hoist and swing drums and travel shaft provide the ultimate in performance . . . smoother, more efficient.

Here's the newest 1¼-yd. shovel-crane, the Lorain-56 —and it has *all* the newest, most advanced features combined into one machine. 2-lever, metered air controls... "Shear Ball" mounting... torque converter... and many, many other *standard* features are included. Operators will like its simple, easy operation and freedom from adjustments. Owners will find the resulting higher production profitable. A few of these outstanding features are briefly described at the left. Get the *full* Lorain-56 story from your Thew-Lorain Distributor now!

THE THEW SHOVEL CO., LORAIN, OHIO

AIR CONTROL OF CRAWLER

Now — air does the work, controls travel, steering, tread lock, swing-travel jaw clutches. Far greater ease of operation. Adds greatly to production.

REMOVABLE COUNTERWEIGHT

New design makes it possible to detach counterweight easily for lower weight when transporting this new Lorain over the highway. Can be removed or installed in minutes.

THE THEW LORAIN.

ASK YOUR THEW-LORAIN DISTRIBUTOR FOR FULL DETAILS ON THIS NEW MACHINE

BLACK'S DREDGE SLEEVE CLAMPS

STURDY • PRACTICAL • DEPENDABLE • ECONOMICAL

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U. S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply . . . positive in action. Write for illustrated folder, today.

THE BLACK BROTHERS CO., INC., 505 9th Ave., Mendota, Illinois

AUTO VORTEX CLASSIFIERS . . .

MOST EFFICIENT BY ANY MEASURE FOR SINGLE OR MULTIPLE SPLITS!

COMPARE RESULTS . . . COMPARE COSTS . . . AGAINST ANY OTHER SAND GRADATION EQUIPMENT! AFTER SUCH COMPARISON, YOU, TOO, WILL BUY AUTO-VORTEX CLASSIFIERS . . . WHATEVER YOUR SPECIFICATIONS . . . WHATEVER YOUR PROBLEMS!

WRITE FOR OUR BULLETIN No. 81!

PATS. PEND.

CHARLES E. WOOD COMPANY

906 NORTH WATER ST. • MILWAUKEE 2, WISCONSIN

designers and builders of equipment for basic industries

Roller Chain

ROLLER Chains of all types are built by McNally Pittsburg for any tonnage or service use, to provide trouble free operation.

To Basic Industries
McNally Pittsburg Offers:

— SERVICES —
Research & Development
Engineering Design — Field Erection

— EQUIPMENT —

Roller Chain	Car Dumpers
Rotary Breakers	Car Hauls
Bucket Elevators	Conveyors
Pumps, Valves, Piping	Pug Mills
Dryers, centrifugal & heat	Crushers
Washers, automatic, heavy media & jig	Screens
	Kilns

McNALLY PITTSBURG MANUFACTURING CORPORATION

— OFFICES —
First National Bank Bldg., Pittsburgh, Pennsylvania — 307 N. Michigan, Chicago, Illinois

— PLANTS —
Pittsburg, Kansas — Wellston, Ohio

Have You Seen the AGIPELLER ?

NEW!
INCREASES OUTPUT!
CUTS COSTS!

THIS SUCTION DREDGE AGITATOR (Pat. Pend.) keeps nozzle clean, loosens compacted deposits, crushes oversized stones. Pays for itself quickly. Write for free bulletin. *Trade mark

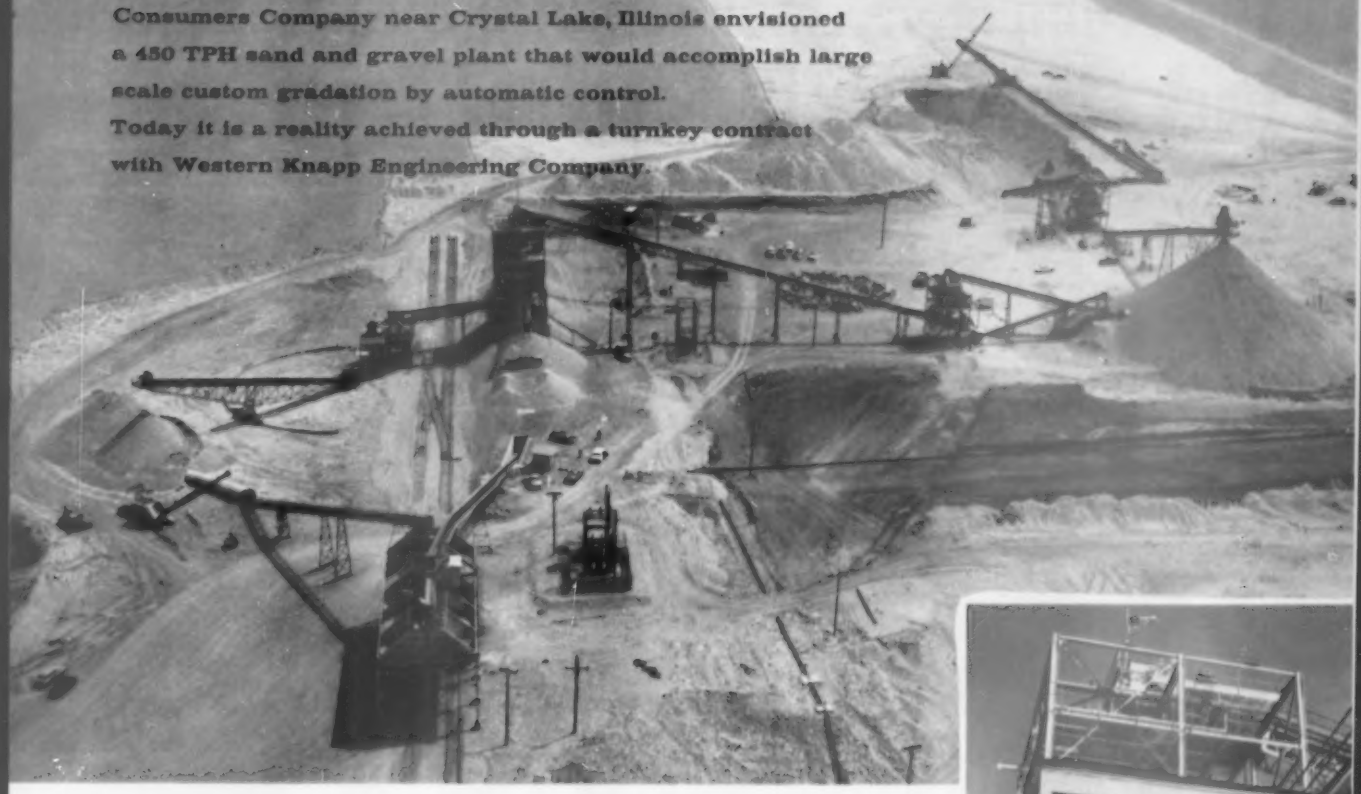
PFARRER-SCHMIDT ENGINEERING CO., INC.
211A W. Wacker Dr. — Chicago, Ill.
Dredge and Pump Engineers

NOTIFY US OF CHANGE OF ADDRESS TO ASSURE PROMPT DELIVERY OF EACH ISSUE OF

ROCK PRODUCTS

WKE brings low cost automation to sand and gravel

Consumers Company near Crystal Lake, Illinois envisioned a 450 TPH sand and gravel plant that would accomplish large scale custom gradation by automatic control. Today it is a reality achieved through a turnkey contract with Western Knapp Engineering Company.



The Consumers' plant was designed for greatest economy of operation with maximum flexibility and speed. **(A 12 yard truck can be loaded in 6 seconds . . . a 70 ton gondola in less than 60 seconds.)** One man at a push-button console station in the main screening structure controls and coordinates every operation from raw storage pile to finished product.

The following are some of the control features:

- One man control for entire plant.
- Relays to start all motors in proper sequence. (Designed to accommodate full load start.)
- Interlocks to prevent overloading.
- Apportionment of desired percentage of raw feed to secondary crushing.
- Optional inclusion of rod mill in circuit to compensate for shortage of natural fines.
- Controlled blending of material from six graded storage piles into a specification product via a tunnel reclaim conveyor to the ten 150 ton loadout bins.

The result is maximum utilization of all available plant products at lowest cost.

All operations can be seen and controlled from this screening tower. Below ground vibrating feeders are automatically controlled to blend desired percentages from six graded storage piles.

A detailed report on this outstanding plant is available upon request.

WKE

Western Knapp Engineering Company

Division of Western Machinery Company

GENERAL OFFICE: San Francisco 7, California, 760 Folsom Street. Dept. J
DISTRICT OFFICES: Chicago 5, Illinois, 431 South Dearborn,
New York 7, New York, 30 Church Street, Room 202,
Hibbing, Minnesota, 1932 Fourth Avenue East

The Problem.....Move 16,000,000 Yards of Rock, Marine Clay, Boulders and Heavy Earth

again the answer was.....

Firestone NYLON TIRES

In excavating the marine channel on Galop Island in the St. Lawrence Seaway, millions of yards of heavy boulder-strewn glacial till are being moved under the toughest haul road conditions.

The Galop Island project is well on its way and as on other Seaway jobs, Firestone nylon tires is the answer because they are tougher tires. They cut big downtime losses, give more retreads and keep tire costs at a minimum.

Firestone nylon tires are built for severe service. The treads give maximum traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

Firestone's Safety-Tensioned *Gum-Dipped* nylon cord body gives greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone nylon tires will cut downtime and increase the profits on your job.

A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP GG WIDE BASE ROCK GRIP RG WIDE BASE ALL NON-SKID ALL TRACTION RIB EXCAVATOR

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, SPECIFY FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

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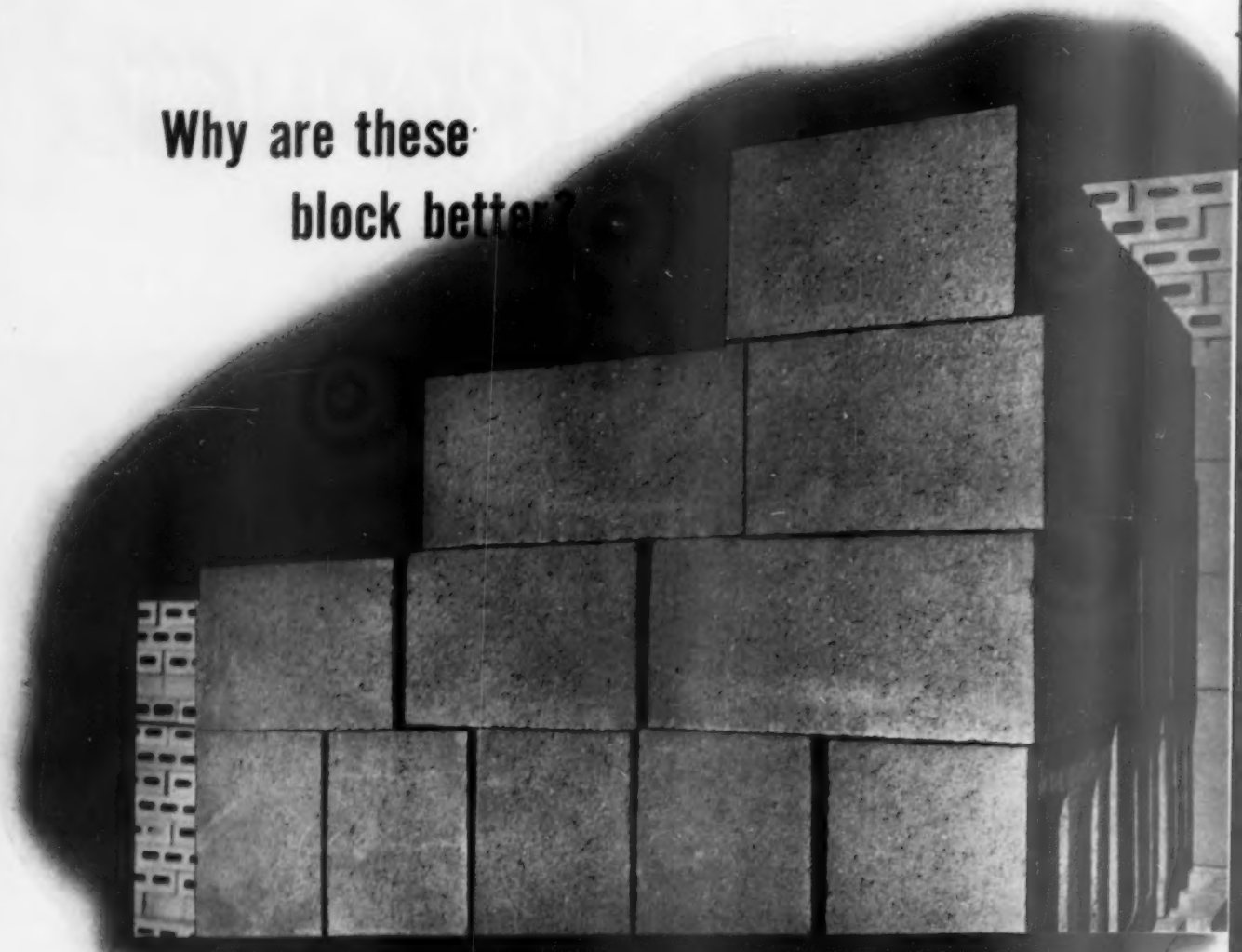
CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

Autoclave Installation of Texcrete Co., Dallas, Texas

Why are these block better?



Because Duraplastic* cement gives richer texture, cleaner edges

Customers are quick to recognize the improved appearance of block made with Atlas Duraplastic air-entraining cement. Concrete products look better and sell better when made with Duraplastic. That's because they have more uniform appearance, true edges, and are more resistant to weather. Naturally these better block make better masonry. That's why customers prefer block made with Duraplastic cement in their masonry buildings.

YET DURAPLASTIC COSTS NO MORE than regular cement—requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write:

UNIVERSAL ATLAS CEMENT COMPANY

UNITED STATES STEEL CORPORATION SUBSIDIARY

100 PARK AVENUE, NEW YORK 17, N. Y.

*"DURAPLASTIC" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

D-165

AIR-ENTRAINING PORTLAND

Atlas® Duraplastic Cement

MAKES BETTER CONCRETE AT NO EXTRA COST

OFFICES: *Albany · Birmingham · Boston · Chicago · Dayton · Kansas City · Milwaukee · Minneapolis · New York · Philadelphia · Pittsburgh · St. Louis · Waco*

United States Steel Hour — Televised on alternate Wednesdays — See your local newspaper for time and station.

INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S CONCRETE PRODUCTS COVER may be seen two of the four autoclaves for high-pressure, high-temperature curing of concrete products in the Texas Industries, Inc. plant at Dallas, Texas. This modern installation was introduced to architects, engineers, contractors, government and banking officials with two open house celebrations on May 18 and 22.

Each autoclave has an inside diameter of 106 in. and is 112 ft. long. Specially designed contour racks accommodate 34 pallets or 102 standard 8- x 8- x 16-in. block. Completely loaded, each autoclave handles 3400 standard block. Operating on two cycles per day, the daily autoclave capacity is 6800 block.

Ready-Mix Firm Expands

THE IDEAL READY MIX CO., Ottumwa, Iowa, has opened concrete batching plants at Albia and Bloomfield, Iowa, and is expanding its concrete plants at Ottumwa and Hedrick, Iowa. The Albia plant is of "one stop" design, permitting the loading of cement and aggregate into mixer trucks in a single position. A four-compartment bin was erected, the storage capacity being 1100 bbl. of cement and 120 cu. yd. of aggregate. The Bloomfield plant will have a three-compartment materials bin, and a conveyor system is being moved there from the Ottumwa plant.

The Ottumwa plant is being expanded with the addition of a 160-ton three-compartment bin and installation of a new conveyor system. Bulk cement storage equipment is being added at the Hedrick operation. Three additional ready-mixed concrete trucks are being added, bringing the total to 21 mixers serving the company's six plants. Twelve of the trucks are equipped with two-way radio for communication with the Oskaloosa and Ottumwa offices. The firm also operates a plant at Sigourney, Iowa.

Acquires Another Plant

TEXAS INDUSTRIES, INC., Dallas, Texas, through a new subsidiary, Louisiana Industries, Inc., has acquired Schwartz Supply Co., New Orleans, La., a ready-mixed concrete producer and building materials distributor which has been in operation for 25 years. Included in the purchase are two associated companies, Washington Sand & Gravel Co., Inc., and East Louisiana Railway Co. Texas Industries plans to modernize the Schwartz facilities, and expand the line with a number of products now manufactured by other plants in the Texas Industries group. The acquisition brings the number of plants operated by the company to 32, in Texas, Louisiana, Oklahoma, Kansas and California. Morgan McCall, vice-president of Texas Industries, Inc., has been named executive vice-president of Louisiana Industries, Inc. Present key personnel at the Schwartz plants will be retained, with James R. Schwartz continuing as vice-president in charge of sales.

Award Winner

NATIONAL CONCRETE MASONRY ASSOCIATION, Chicago, Ill., display at the national convention of the American

N.C.M.A. award winning display at the convention of the American Institute of Architects

Institute of Architects received the highest award for "Outstanding Attractiveness" from among 85 exhibits. Featuring a textured wall design and a reflection pool of halves and pilaster units, the exhibit also utilized "Rocklite" split block and expanded shale aggregate.

Installs Six Autoclaves

CINDER BLOCK, INC., Detroit, Mich., has begun operation of a recently installed high-pressure steam curing plant, which required the construction of two plant buildings at a cost of over $500,000. The buildings house six steel autoclaves, 68 ft. long and 10 ft. in diameter, each weighing 60 tons, and replace the former steam kiln building, formerly used for all curing. Each autoclave holds 2700 concrete units and operates on two cycles daily, producing more than 32,000 units daily. The curing building also houses a laboratory for quality control of the concrete units. Walter W. Horn is president of the company, and Herbert J. Vincent is sales manager.

RADCLIFFE READY MIX CONCRETE CO., INC., Vine Grove, Ky., has been incorporated to deal in concrete products and by-products, with an authorized capitalization of $50,000. Gilbert D. Hill, Valley Station, Ky., H. McKay King, Clarksville, Tenn., and Coy B. Wade, Valley Station, Ky., are incorporators.

DICKERSON STRUCTURAL CONCRETE CORP., Youngwood, Penn., has been formed and construction of the manufacturing plant has started. Five 430-ft. casting beds, offices and a railroad spur are being built initially.

Production of structural shapes such as double-T, channel, slab, rectangular and I-beam is expected in several weeks. The parent firm is a well known bridge builder.

RUBY LUMBER CO., Madisonville, Ky., has opened a prestressed concrete plant, producing concrete roof channels and beams, floor slabs, bridge girders and complete bridges. Clyde Ruby is owner of the company.

THE FARLEY CONCRETE, INC., Perrysburg, Ohio, has been incorporated by Joseph V. Farley, Charles E. Farley and Elsie M. Farley. Capitalization of 250 shares no par common stock was authorized.

KURTZ GRAVEL CO., Flint, Mich., suffered an estimated $5000 damages to its ready-mixed concrete plant when a fire damaged two floors of the plant. The fire was caused by a furnace explosion.

PIONEER SAND & GRAVEL CO., Seattle, Wash., has purchased Canal Ready-Mix Concrete Co. G. N. Scott, president of Pioneer, reported that his company now has one of the largest fleets of mixer trucks in the West.

J. L. SHIELY CO., St. Paul, Minn., is completing plans for a sand, gravel and ready-mix concrete plant to be located on the Minnesota river near Savage. The plant is estimated to cost $1,000,000.

NELSEN CONCRETE CULVERT CO., Indianapolis, Ind., has built a plant for the manufacture of precast concrete units for bridges.

KOLTCZ CONCRETE BLOCK CO. is building a concrete block plant, costing about $50,000 in Walton Hills, Ohio.

EVANS, COLEMAN AND EVANS LTD., Marpole, B. C., will open a plant to manufacture a complete range of concrete sewer and culvert pipe.

You get ALL this with a..

TRI-MATIC

power—

All motors and component parts, designed specifically to deliver "super-power" to meet today's demand for higher production.

ruggedness—

Engineered and built to provide continuous high-speed operation under the most exacting operational conditions.

production—

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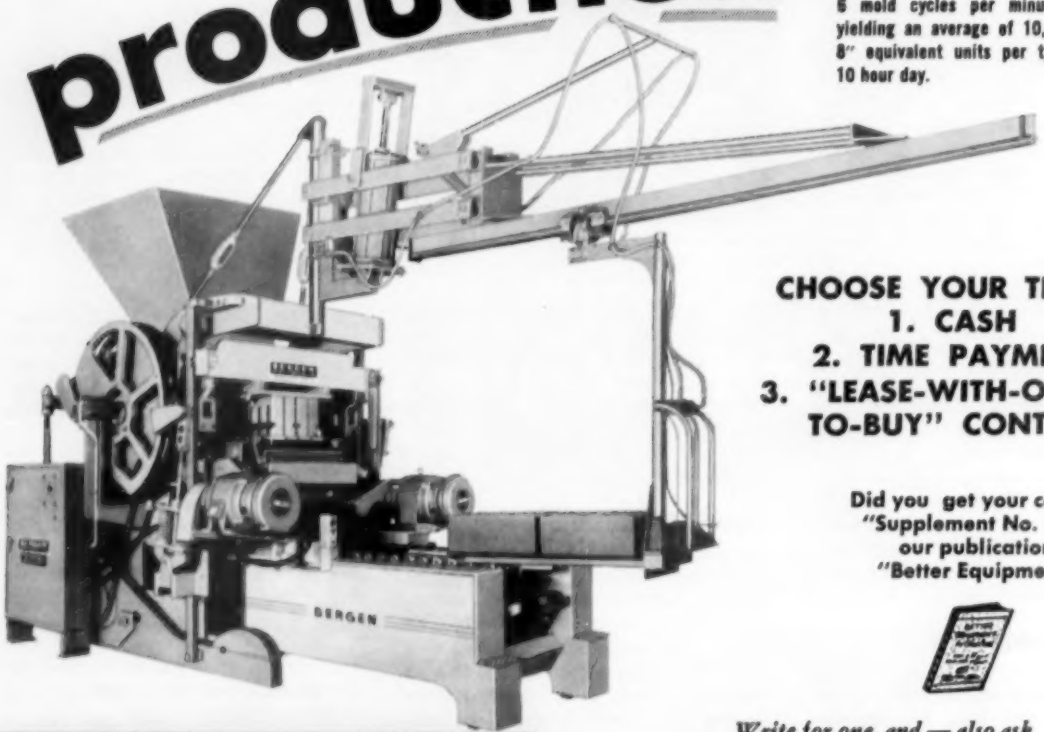

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Did you get your copy of "Supplement No. 1" to our publication, "Better Equipment"?

Write for one, and — also ask for free literature and prices on any or all our block plant machines or accessories.

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The split block fireplace lends warmth and beauty to this concrete masonry living room. A product of someone's imagination, it's just one example of the unlimited combinations that are possible with concrete units of various shapes and sizes.

When you suggest imaginative combinations like this for your masonry units, you step out in front of competition . . . develop new business that pays off in easier, more profitable sales.

For the most profitable production, include Lehigh Cements in your plans. Remember there's a Lehigh Cement to help you produce quality units with any manufacturing process.

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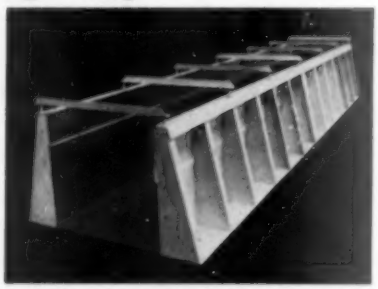
LEHIGH PORTLAND CEMENT COMPANY
ALLENTOWN, PA.

PRESTRESSED CONCRETE BRIDGE BEAMS

In many sizes WITH A SINGLE 300 to 400-FOOT INSTALLATION OF...

Now-mass production in a big way!

The newest addition to the Form-Crete line (illustrated at the right) has been carefully engineered to provide the utmost flexibility for mass production of all sizes of rectangular bridge beams. Designed to withstand maximum operating and casting deflection loads the basic forms produce a rectangular beam 33 inches wide and 36 inches deep. Additional casting pallets are available in several widths and heights, enabling the manufacturer to cast all practical sizes of rectangular bridge beams utilizing the same single set of side forms. This economy feature, coupled with the uniform accuracy of all Form-Crete castings are but two of the many advantages that contribute to Form-Crete superiority. Investigate this new way to greater prestressed concrete product profits.



These Form-Crete rectangular bridge beam side forms and pallets are manufactured in 10-foot lengths for handling ease and are designed to produce a product that meets the demands of modern construction.

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PP-4

FOOD MACHINERY
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FLORIDA DIVISION
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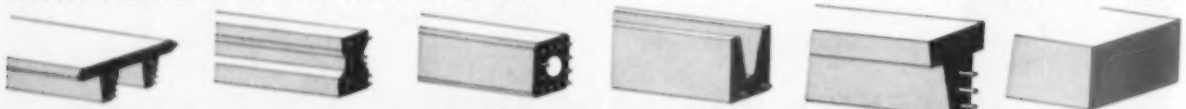
FORM-CRETE STEEL FORMS FOR CASTING REINFORCED OR PRESTRESSED CONCRETE



DOUBLE "TT" SLABS | BRIDGE BEAMS | SQUARE AND OCTAGONAL PILING | HOLLOW AND SOLID LINTELS | SINGLE "T" JOISTS | PAN TYPE BRIDGE DECKS

Centralized mixing installation. Control panel enables one man to supervise entire mixing operation. Two scales weigh cement and aggregates into concrete mixer

Close-up of master control panel which contains three sets of selector dials with four dials each. Repeat mix formulas can be locked into one or two sets of dials; a third is for short runs

Proportioning System

Measures, Records and Delivers Materials

PRESCRIPTION CONCRETE

. . . is made possible at the J. P. Loomis Concrete & Supply Co., Akron, Ohio by special weighing apparatus and master controls operated by one man

AUTOMATICALLY-CONTROLLED by one man working from a central control panel, a new concrete proportioning system measures, records and delivers concrete materials to the mixer at J. P. Loomis Concrete & Supply Co., Akron, Ohio. Making up a large number of different mixes, the new system is said to be accurate to ¼ of 1 percent on cement weights and ½ of 1 percent on aggregates. Special panel controls record weights, lock formulas into the system for repeat runs and provide automatic compensation features.

The entire operation is centered around two "Select-O-Weigh" scales and a master control panel manufactured by Richardson Scale Co. From the control panel, the operator dials out the exact amount of each material required for the mix. Materials are weighed cumulatively, weights are automatically recorded, and then delivered to a mixer, water is added and the mix is dumped into the ready-mixed concrete truck. The complete proportioning and mixing cycle takes approximately 2 min.

The Loomis plant has been in operation since 1950. At the concrete plant all storage bins, proportioning equipment and mixers are installed around a single platform to permit a one-man operation, rather than having weighing, mixing and dumping operations on three different levels.

This ready-mixed concrete company's business is highly diversified, with orders coming from private individuals, business concerns and state and local government agencies. Its peak concrete production is about 840 cu. yd. per day, and it can prepare 30 mixes an hour at a rate of 90 cu. yd. per hour.

Before installing the new system, the company used an improvised scale arrangement for measuring concrete ingredients. This system had no automatic recording features built into it. During a mixing operation, the operator would record on graph paper the amount of each material he had fed into the mixer. This sometimes led to inaccuracies of 30 lb. per ton.

Gravity flow of ready-mixed concrete materials provided by building plant alongside hill

Of the new scales, one has a 5000-lb. capacity, calibrated in 5-lb. units, and is used for weighing cement. The other, a 10,000-lb. capacity scale with 10-lb. increments, weighs aggregates and can handle up to any three out of five per mix. These scales are accurate within these increments.

The Select-O-Weigh control panel contains three selector dial systems, each containing four dials, and provides push-button control of every phase of the mixing operation until the concrete is delivered to the mixing truck. In this way, the operator can control the entire operation without moving from the platform—and know that the mix will be accurate.

In addition to speed and accuracy with the new system, the automatic recording mechanism is valuable in providing a permanent record for checking. As each material is fed into the scale, its weight is recorded on a paper tape. At the end of the proportioning operation, the operator removes the printed portion of the tapes from the machines, compares them with the actual order from which he set the selector dials and then attaches the tapes to the order as a permanent record of the delivered weight of each ingredient.

This eliminates any question of accuracy or quality, particularly when mixing new formulas. And the operator is able to double-check his own work after he has dialed the formula into the system.

The formula locking mechanism permits the operator to repeat a desired mix once it has been set up in the selector dials. If the operator knows he will be running the same mix several times, he can lock the dials on this formula and then simply press a dial button whenever he wishes to repeat it.

With three banks of dials on the control panel, the operator can lock formulas on one or two sets of dials for long-run formulas and still have the third set open for one-shot or short-run mixes. The locking device also insures that identical mixes will be obtained every time it repeats a run.

To prevent any carryover of previ-

Ready-mixed concrete truck taking a load from the plant mixer. The new proportioning system permits preparation of 30 mixes per hour at the rate of 90 cu. yd. per hr.

ous weighings, the Richardson scale employs an electrical automatic mechanism. Following scale discharge into the mixer, a tare check circuit is energized to prevent starting of the next weighing cycle until all material has cleared the weigh hopper and the scale is in perfect empty balance. This balance is verified by the dial scale pointer.

Should the actual weight of each material in the scale differ from the dialed weight by more than the present tolerance, the entire system stops and a red warning light for under or overweight flashes at the control panel. This allows the operator to use manual controls to correct the mistake or account for it by proportionately increasing the other ingredients.

Concrete materials are stored in seven bins—two for cements, five for such aggregates as gravel, slag, sand and limestone — located above the mixer. Bins are electrically connected to the control panel. Aggregates are dropped by gravity; cement is carried into the system by an air-flow process.

When the operator cycles a formula, he stands at the control panel and sets the selector dials controlling each ingredient for the amount specified on the customer's order. He then presses the Start button to actuate the feeder mechanism. The amount of material set on the first aggregate selector dial and the amount of cement set on the cement selector dial is then fed to the automatic scales.

When the quantity specified on the control panel is reached, the feeding stops and the aggregate scale then repeats the operation for the next ingredient. This continues until the formula is completed. When the scale dials show the desired amount for the complete formula, the operator checks the printed tapes against the customer's order. Then he sets the mixer in motion.

Water is added from an automatic meter, which shows the operator the amount of water entering the mixer. During the mixing operation the operator can open the mixer and observe the operation without moving from the platform.

The loading station for the mixing truck is located directly below the mixing plant. When the mix is completed, the operator presses a panel button which actuates a hydraulic mechanism that tilts the mixer. The concrete then pours through a two-door opening in the mixing platform into the truck bed.

No major difficulties with the scale or control panel have been reported since the system was installed. The mixing plant is hosed down once a day to keep dust at a minimum, and the scales and panel are covered with canvas during this period to protect them from water.

A similar system has been installed at the Loomis company's Hudson, Ohio plant.

Special recording feature of scales records amount of each material fed into a concrete formula. This serves as a permanent record of each mix, and the operator can check back on the formula originally fed into the system

Buys Concrete Pipe Firm

AMERICAN PIPE AND CONSTRUCTION Co., Los Angeles, Calif., has purchased Hooper Concrete Pipe Co., Phoenix, Ariz. The Hooper plant has been operating for about 10 years, and will continue under the same management despite the acquisition. American Pipe and Construction Co. plans to enlarge operations at the plant, adding facilities for making several other classes of reinforced concrete pipe. It also operates divisional plants in South Gate, San Diego, and Hayward, Calif., and Portland, Ore. It also has as associate firms, Amercoat Corp. and Pipe Linings, Inc., Los Angeles, Calif., and Gifford-Hill American, operating plants in several cities in Texas. The firm is currently operating a plant in Bogota, Columbia.

An excellent medium for promoting concrete block is the home show, according to B. H. Palmer, owner, Southern Tier Concrete Products Co., Alfred, N. Y. This view shows his company's exhibit held at the recent successful three-day Hornell Home Show which was sponsored by two lumber and supply dealers in Hornell, N. Y. The exhibit featured split-block and colonial siding block

Enlarged laboratory, overhead bins, and aggregate conveyor belt of expanded plant

AUTOCLAVES

Boost Texcrete Production

EXPAND CAPACITY

. . . of Texas Industries block plant at Dallas with four new autoclaves, a third block machine, and more bin capacity. Double size of research laboratory

ANOTHER MILESTONE in the rapid growth of Texas Industries, Inc., Dallas, Texas was marked by the recent installation of four autoclaves at its Texcrete plant. Increasing demand for Holiday Hill Stone and Canon Brick concrete products made it necessary to increase plant capacity. Open house celebrations were held on May 18 and 22 for architects, engineers, contractors, government and banking officials with another open house for employes on May 19.

To permit two-shift production, a third Besser block machine was added along with additional overhead bins, underground conveyor, elevators and auxiliary equipment. A new bin was needed to provide storage for pozzolanic material used in the mix for high-pressure cured block, and another bin for white cement so that it could be handled in bulk. Bin compartments have been provided for various grades of Haydite aggregate used in block manufacture, and different grades of limestone for Holiday Hill Stone and Canon Brick. The new bins made necessary the installation of a double traveling weigh batcher so that all three 50-cu. ft. Bessers mixers may be served from any of the aggregate or bulk cement bins.

Each autoclave is 106 in. inside diameter and 112-ft. long and is equipped with a quick-opening door supplied by Kramer Engineering Co. The door is opened and closed by an air motor operating on 90 p.s.i. pressure from the plant's compressed air distribution lines. Steam for the autoclaves is supplied by a 150 p.s.i. Continental boiler with a nominal rating of 400 hp., although it will actually produce 480 hp. on a continuous basis. It is fired with a natural gas burner. A standard feed-water heater set up feeds water into the boiler at approximately 210 deg. F.

Completely loaded, each autoclave handles 3400 standard 8- x 8- x 16-in. block. Operating two cycles per day, the daily capacity per autoclave is 6800 block, and four autoclaves provide a daily capacity of 27,200 block.

On a one-shift operation, the morning production from the block machines goes directly into the autoclaves, and a curing cycle is begun as soon as the autoclaves are filled.

The afternoon production of the machines finds all autoclaves filled and under pressure. These block are diverted into holding rooms. Three new holding rooms have a capacity of 3200 block each. Steam is fed into the rooms to keep the block damp and in good condition for the autoclaves later. When the first curing cycle is complete, the autoclaves are "blown down" as quickly as possible. Blow down requires about 20 min. When the doors are opened, large ventilating fans pull outside air through the cylinders so that fork lift drivers can immediately begin unloading. The block in the holding rooms are used to reload the autoclaves for the second cycle. Normally the unloading-reloading operation requires approximately one hour, using two fork lift trucks.

Specially-designed contour racks, adopted as standard for all Texas Industries operations, permit maximum loading of the autoclaves. Each rack accommodates 34 pallets or 102 standard 8- x 8- x 16-in. block. Studies showed that it is possible to cure more block per inch of autoclave diameter

(Continued on page 172)

(1) **One of the four autoclaves** being loaded with block

(2) **Boiler** supplying steam to autoclaves is 150 p.s.i. capacity with a nominal rating of 400 hp.

(3) **Rear view of four autoclaves,** showing blowdown muffler and stack at left, valves for controlling blowdown, below, and exhaust fan controls, above

(4) **Ventilating fan** pulls outside air through cylinders when autoclave doors are opened

(5) **Specially-designed contour racks** hold 102 standard block

(6) **Four autoclaves,** each of which is 112 ft. long with an inside diameter of 106 in.

(7) **Sealing** one of the quick-opening autoclave doors which is opened and closed by an air motor

Sacking and sewing operation, to the left, and control panel for accurate proportioning, to the right

By WALTER B. LENHART

Electronic Proportioning for Dry Mix Concrete Products

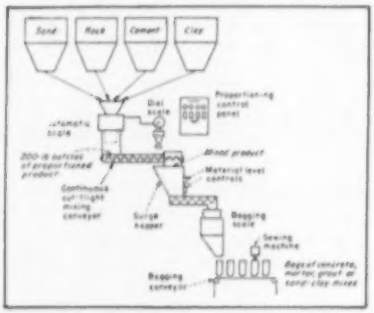
A NEW WEIGHING SYSTEM, remotely controlled, is being used to weigh, batch and package several useful concrete products for the benefit of the customer at Roseville, Calif. Dry Mix Products Co. uses the system to electronically proportion materials in a batch to eliminate waste and mess, mistakes and guesswork for the customer who wants to do a small construction job.

The modern, fully automatic Select-O-Weigh system was announced a couple of years ago by Richardson Scale Co., but the installation at Dry Mix Products Co. is one of the first units in the rock products industry.

The system as installed at Roseville allows a superintendent to set control instruments on a control panel to automatically weigh and batch concrete or other aggregates at the plant. The process insures correct proportioning—since the plant operator cannot easily change the settings—which is important to ready-mix plants where the amount of aggregate and portland cement is constantly changed to produce specified concrete strengths.

The new system is an important development, for it should have many uses in the concrete block industry, concrete pipe, and for the accurate dry batching of any two or more ingredients. Other suggested uses for it are blending of materials for gypsum wallboard and gypsum lath production, blending of trace and other minerals into agricultural limestone, and others.

The automatic scale installation at Roseville, while working with relatively small tonnages (per minute), has no top reasonable limits as to the tonnages it can handle accurately. Top production at the plant is 15 t.p.h. Material is delivered in 200-lb. batches every few seconds to the continuous mixer, as shown in the accompanying diagram. One man operates the entire assembly of units that make up the packing section. Segregation is reduced by use of the flight conveyor that makes up the continuous mixer.



Automatic proportioning and packing diagram

A number of products are made by Dry Mix Products Co., and each is designed to enable the customer to do a specific repair job without previous experience and without a lot of extra effort. The owners and operators of the company are old hands at the production of aggregates, sand and gravel, etc.—and their experience is in producing material by the train-load. At Roseville, a few miles east of Sacramento, they have put that experience to use in preparing and successfully marketing useful mixes, from packages as small as 2 lb. for patching to as large as 100 lb. for larger jobs.

The products made include dry mix concrete for the occasional user. It is a weighed blend of sand, quartz gravel and portland cement and is packed in paper bags of 60, 90 and 100 lb. each. Top size of the coarse aggregate is ¾ in. Dry Mix mortar, another product, is a mix of fire clay and mortar sand and, with portland cement, gives high plasticity. That product is used primarily for brick and block work. Dry mix grout or topping is a mix of sand, portland cement and a selected clay. It is used for top finishing, setting machinery, grouts, and for similar uses.

Dry Mix exterior stucco is a mix of ⅛-in sand and a plastic, waterproof cement for patching stucco jobs. Dry Mix plaster is a mix of zonolite and fibered hardwall (a gypsum plaster). It is excellent for small plaster patching jobs, etc., and comes in 25-lb. bags. The company also prepares and distributes Dry Mix plaster sand, Dry Mix white cement topping, Dry Mix white tile grout, Dry Mix white roofing gravel, Dry Mix charcoal for the barbecue operator, Dry Mix fire clay and Dry Mix U-Pave. The latter is a black top paving material prepared for the occasional user; it is sold in one-gallon cans.

One of the more recent products prepared by the company is a Dry Mix Cement Adhesive. It is a cementa-

ceous material that will enable portland cement concrete to adhere to practically all smooth surfaces as well as old concrete. With its use, portland cement mortars can be made to adhere strongly to wood, steel, old plaster or concrete. It is packaged in 30-oz. containers and in 1-gal. wide-mouthed jars. Dry Mix Terra-Till is a new soil conditioner now being packaged.

Raw materials for most of these products are secured from sources near Roseville. A white, marble-like limestone, a high-quartz gravel and sand are the main ingredients of most of the dry mixes. A 25-ft. x 30-in. diameter gas-fired rotary dryer is used for pre-drying the materials. It operates without cover. Dried materials are elevated to their respective steel bins over the sacking and weighing equipment. Four steel bins are available.

Three sacking stations are available in the plant. Dry mix concrete is sacked with the Richardson scale system, details of which are included in the flow diagram of that plant section. Two Syntron electrical vibrators keep the materials moving, which prevents material packing. Two Hyster and Wagner lift trucks handle the palletized material.

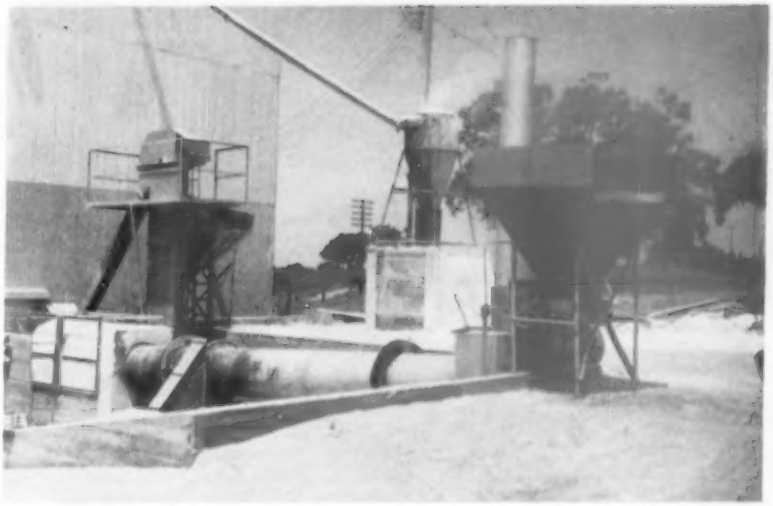
A small surge bin over the bagging scale is equipped with electronic bin controls. Controls operate so that bagging stops if the bin is low on material. But if the bagging falls behind, an upper bin control stops the equipment ahead of the surge bin until normal conditions return. Then, controls cause the operations to resume automatically. Accuracies in weighing and batching are about 0.1 percent.

The Richardson control panel at Roseville is in the plant near the main sacking unit. It is so located that the operator can have a clear view of the pilot lights that show the status of feeding, weighing, blending, mixing and handling operations. Should trouble develop, those lights indicate the source.

The panel is equipped with four vernier dials, one each for sand, rock, cement and clay ingredients. Desired weights for each of these components are selected and set on the respective vernier. The operation then is automatic. Quantity of each material is delivered to the weigh hopper in accordance with the respective dial setting. Flow of material is automatically stopped when the pre-set amount has been delivered.

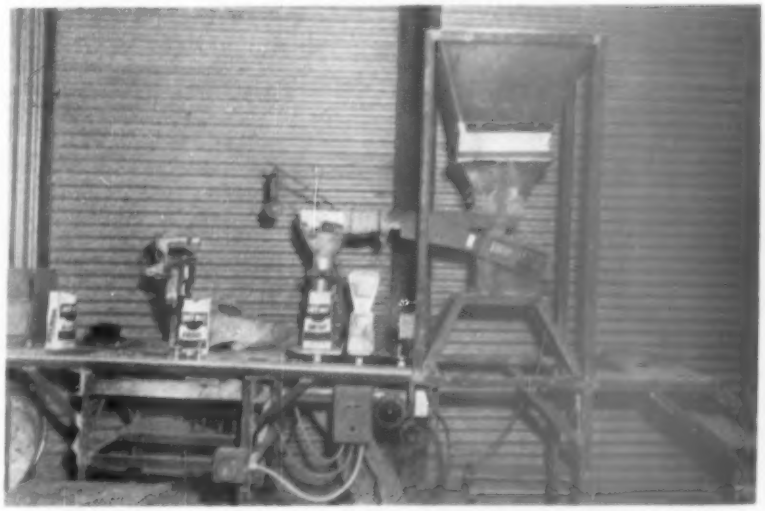
Packaging of small quantities (such as 2-or 5-lb. paper bags) is done by a separate machine that the company has assembled for that purpose. The machine comprises a hopper under which

(Continued on page 174)



A 30-in. by 25-ft. dryer is used to prepare raw materials for the Dry-Mix concrete plant

Tractor-loader filling hopper which supplies dryer. Warehouse and packing plant are to the rear



Packing set-up to fill containers as small as one pint. Note small electric vibrator

Geo. W. Ford, R. H. Wright & Son, Ft. Lauderdale, Fla., retiring president, left; and **J. Ashton Gray,** Stress-Crete, Inc., Leesburg, Fla., new president

George W. Ford, head of the concrete department of R. H. Wright & Son, Inc., Fort Lauderdale, Fla., was succeeded by J. Ashton Gray of Stresscrete, Inc., Leesburg, Fla., who with Mr. Ford was one of the founders. Ben C. Gerwick, Jr., of Ben Gerwick, Inc., San Francisco, was elected vice-president. Douglas Cone of Florida Prestressed, Tampa, is secretary-treasurer. New directors are: George W. Ford; T. Y. Lin, University of California, Berkeley; Harold Price, Basalt Rock Co., Napa, Calif.; Werner Rousch, Lewis Mfg. Co., Miami; Charles C. Zollman, Springfield, Penn.; Arthur C. Bruce, Woodstock, Ont.; Carroll Strohm, National Breeko Block & Tile Co., Nashville, Tenn.

The program for the three-day meeting, arranged by Dr. A. M. Ozell of the College of Engineering, University of Florida, was crammed full of tech-

Prestressed Concrete Producers Plan for Big Expansion Program

THE PRESTRESSED CONCRETE INSTITUTE, which held its second annual convention May 16, 17 and 18 at the Hollywood Beach Hotel, Hollywood, Fla., has come a long way since a group of seven companies launched the organization in 1954. Born and bred in Florida, it has grown into a nation wide association with more than 100 members. The 1957 convention will move to San Francisco, where the affair may have a strong international flavor, as the World Conference for Prestressing has been invited to meet there jointly.

At the Hollywood convention nearly 300 persons were registered from 28 states, Canada, Cuba and Panama. The Institute formally launched an official publication, the *Journal*, which will be published quarterly and contain technical articles on prestressing. A four-page news sheet, P C Items, will be continued. During the past year it has co-sponsored a $23,000 research program at the University of Florida; two short courses on prestressed concrete, one with the University of Florida, the other with Clemson College; and has sponsored an industry-wide set of specifications for prestressed design and production.

nical discussions, except for the second day, which was devoted to visits to plants and job sites, including the prestressing yards of the Lewis Mfg. Co. in Miami and R. H. Wright & Son, Inc., at Deerfield. Panel discussions occupied the first day, while the last day was devoted to the reading of seven technical papers, followed by discussions.

Subjects of panel discussions were Production and Inspection, Materials and Techniques, Application and Specifications. Each panel member pesented a short statement on some phase of the general subject. When all of

Some of the speakers at technical sessions. Left to right: Curzon Dobell, Dr. R. W. Kluge, T. Y. Lin, and W. E. Dean

these statements had been read, the session was thrown open to general discussion.

P. J. Verna, Jr., of Concrete Materials Co., Charlotte, N. C., was chairman of the Production and Inspection group. Other panel members were: H. A. Price, Basalt Rock Co., Napa, Calif.; E. K. Rice, Western Concrete Structures Co., Los Angeles, Calif.; J. C. Rundlett, Department of Public Works, Boston; D. A. Sawyer, University of Florida, and Werner Rousch, Lewis Mfg. Co., Miami, substituting for A. C. Bruce, Schell Industries, Windsor, Ont., who was unable to be present.

Ideas of what an adequate prestressing plant should be, were given by Harold A. Price. "As much as five or 10 acres are needed," he said, "for a properly arranged plant. Our plant has 3.4 acres of covered plant and warehouse, 0.4 acres of prestressing beds, five acres for storage, two acres for future prestressing beds, four acres for future storage, a total of 18.8 acres."

"We have," he said, "three civil engineers, six draftsmen and one estimator, a total of 10, also two civil engineers supervising erection and a production manager who is a mechanical engineer."

Mr. Price declared that an adequately staffed and equipped laboratory is a necessity. Its principal functions should be: (1) mix design; (2) control of mix at batch plant (compensating for free moisture in aggregate and checking yield); (3) testing of aggregates; (4) determination of curing cycle; (5) making of test cylinders; (6) testing of cylinders to determine compressive strength so plant will know when members can be tensioned; (7) calibration of jacks and pressure gauges; (8) certification of product for compliance with specifications; (9) quality control.

The Basalt Rock Co.'s laboratory contains the following equipment: a 300,000 lb. Baldwin testing machine, 70 deg.-95 percent humidity curing room, 70 deg.-40 percent humidity control room, autoclave, Gilson screen, No-Tap screen, Whitmore strain gages, Anderson Strainmeter, Carlson gage, paddle-type and pan-type concrete mixers .

Mr. Price said: "I believe we were the first in the country to use the horizontal-pan, English type mixer. This machine produces concrete with about 15 percent more compressive strength than the same mix design will make in a conventional drum-type mixer. Naturally savings in cement are possible. It will also mix and discharge no-slump concrete, which we feel is the ultimate aim for all prestressed work."

Left to right: Douglas Cone, Prestress, Tampa, Fla., secretary-treasurer; Ben C. Gerwick, Jr., Ben Gerwick, Inc., San Francisco, vice-president; and J. Ashton Gray, Stress-Crete, Inc., Leesburg, Fla., new president

He also said his company has found the new Freyssinet "H" type automatic dewedging jack to be "far advanced over any previous model for similar work."

One drawback of some yards, Mr. Price said, is that tensioning beds often do not have the flexibility to be readily adapted to new applications, frequently being too long for a small job without excessive form cost. He said his company has one prestressing bed that might be of particular interest to others. It is 27 ft. wide by 180 ft. long, with an intermediate removable abutment at 80 ft. from the stressing end. It also has a letdown device which permits the shortening of the bed in 4-ft. increments up to 40 ft. from the de-stressing end or from either of the semi-fixed dead end abutments. "This bed," said Mr. Price, "is truly universal."

Basalt Rock Co. has found both pneumatic and electric type vibrators to be satisfactory. The pneumatic type has a higher maintenance cost, Mr. Price said, but has the advantage of higher frequencies. Mr. Price said his company has found that a flash-type boiler does not produce sufficient steam for curing. Basalt is using a horizontal drum-type tube marine boiler which produces 200 h.p., but will soon need additional capacity.

The question of mechanical handling evoked considerable later discussion. Basalt uses two 25-ton cab-operated cranes in the shop. In outside areas and over pretensioning beds it has been found that two 10-ton lift trucks "are more versatile than a 20-ton mobile pneumatic-tired crane." But Mr. Price added that this would probably not be true if the yard was not paved. The matter of highway transportation will be of great concern, Mr. Price said, to many prestressers as girders get longer. At present his company can transport 40-ton girders, 80 ft. long, over California roads, but he said that new equipment and new methods will have to be devised for the longer sections that are surely coming.

"This industry is only in its infancy," said Mr. Price. "Eventually investments will not be measured in thousands but in millions. My best advice is to be sure you have plenty of room available for expansion, strategically located for rail and water shipments."

Among the deficiencies in many yards he listed: Insufficient property,

Three of the speakers at technical sessions. Left to right: C. E. Ekberg, H. J. Godfrey, and Thor Germundsson

lack of engineering talent, testing and research facilities, aggregate and cement storage facilities, batching and mixing equipment, jacking equipment, universal tensioning beds, vibrating equipment, curing facilities, lifting equipment, transportation equipment.

D. A. Sawyer of the University of Florida said one of the hardest problems for the inspector of prestressed concrete to decide is the tolerances. He thought inspectors should be given some leeway.

J. C. Rundlett of the Boston Department of Public Works thought that the cause for rejection of a prestressed beam is usually immediately apparent. He said that prestressed members need not be made "to a watchmaker's precision." With reasonable care, he said, the beams made in a plant where there is good control will be better than those made in the field.

Werner Rousch of Lewis Mfg. Co., Miami, discussed curing. He said his company uses a double tee form which gives maximum turnover. Steam curing pays off, allows more production and gives a better product than moisture curing, he reported.

E. K. Rice of Western Concrete Structures Co., Los Angeles, said that prestressing operations contain some unique hazards. In wire handling and stressing the operator is dealing with large forces which can cause great damage if not carefully watched and controlled. He said his company proofloads its mechanisms once a month to guard against failures.

P. J. Verna stressed the importance of standardizing on prestressed items in order to make a profit. "When we deviate from our standard units, "he said, "we almost double our costs. We have standardized on three or four items." He said he has found that prestressing cannot compete successfully with steel or other alternates unless costs are kept down. "We have had to develop a personnel," he said, "who can inspect all items. If you don't rigidly pre-inspect, you are selling yourself down the river. Tolerances are a problem." The best way to make a profit, he said, is to pour regularly every day into the same sets of forms.

In the discussion which followed these talks, a question arose as to which type of material handling equipment is best suited to a prestressing yard. The upshot seemed to be that it depended on the conditions of the particular yard. It was agreed that overhead cranes give the fastest service. Lift trucks were recommended for getting material out of cramped spaces. One company uses a crawler type in preference to an overhead crane. For barge loading, another company found a locomotive crane the most efficient.

A discussion on steam curing brought out the opinion that for curing in 3 to 4 hr., a temperature of 120 to 140 deg. is most suitable and that anything over 140 deg. tends to decrease the strength of the concrete.

On the question of tolerances, W. E. Dean, bridge engineer of the Florida State Road Department, said a stressing tolerance is necessary, but he thinks 5 percent is reasonable, with the error, if any, on the side of a slight overstress. He said he has been able to maintain state jobs on that basis.

A question arose as to the economical length for beds. There was opinion to the effect that 250 ft. is the best length for centralized control and that there is considerable lost time when beds run from 400 to 500 ft. However, it was pointed out that there is a tendency toward longer members and that long beds will be needed for them. One prestresser said, "We may need 600-ft. beds before long." One thought was this: Analyze your market, see what you can sell, and then set up beds for that material.

In the panel on Specifications, H. J. Godfrey of John A. Roebling's Sons Co., Trenton, N. J., presented a proposed specification for uncoated seven-strand wire.

(Continued on page 170)

Moderately Priced;
Top Quality Production;
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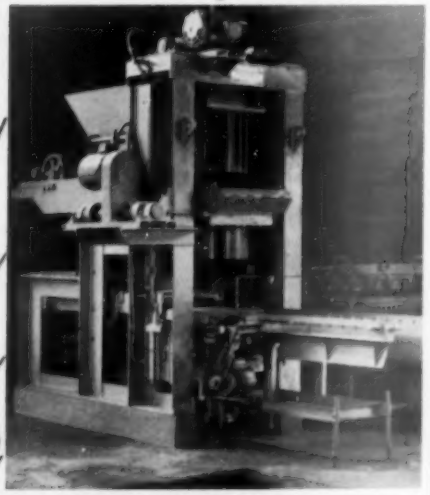

THE GEORGE PRESSPAC—FULLY AUTOMATIC PLAIN PALLET MACHINE

F. C. GEORGE MACHINE CO., INC.

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Orlando, Florida

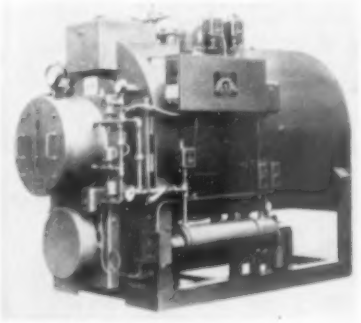
NEW MACHINERY

Block Loader-Unloader

ELBERFELD MANUFACTURING CO., INC., Elberfeld, Ind., has announced a loader and unloader for concrete block, brick, cement, stone, etc. Called the "Jiffy Lift", it is available in Model E 6 and Model E 7, both of which can be installed either on a recessed track or on a track on top of the truck bed.

Both models of the Jiffy Lift are 92 in. wide from center to center of tracks. The overall width is 95 in., whether installed as a recessed track or track on bed. Model E 6 is designed to handle six rows of 8-in. block, and the E-7 can handle seven rows of 8-in. block. Overall clearances are 78 in. and 86 in., respectively.

One man can operate the lift, from either side of the truck. Four-wheel drive for safety and ease of operation, and 4-cable suspension to permit lifting of 10,000 lb. without swinging are features of both models.

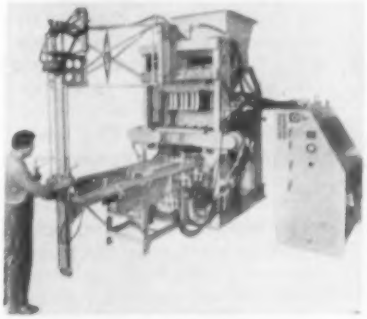


Automatic Boiler

BOILER ENGINEERING & SUPPLY CO., INC., Phoenixville, Penn., has announced the Model N50 boiler, an addition to its standard line of 20 to 500 hp. Continental automatic boilers, which handles up to 50-hp. requirements. It measures 7 ft. 2 in. long, 3 ft. 4 in. wide and 5 ft. 2 in. high. Clearance of less than 4 ft. from both front and rear doors is required for tube removal. The boiler is equipped with a burner, boiler trim, automatic controls, fiberglas insulation and metal jacket, and can be furnished to burn light oil, No. 5 oil or gas. Combination units that burn either gas or No. 5 oil or lighter are also available. The burner is a forced draft type, and fires directly into the water-backed furnace, eliminating the need of a special refractory firebox lining. Controls include pressure or temperature switch, low water cutoff, electronic type combustion safety control, fuel solenoid valves, and burner motor starter.

Masonry Saw

DIAMOND TOOL ASSOCIATES, 940 East El Segundo Blvd., Hawthorne, Calif., has announced a masonry saw for wet or dry cutting. It is designed for blade capacity up to 14½ in., for use on various kinds of masonry and ceramic materials. Special features are a self-priming pump, and a Diamond lock and water system. No lubrication is said to be required, as the bearings are factory-greased.



Concrete Block Machine

MULTIPACK, INC., 7401 Grand Division Ave., Cleveland 25, Ohio, has announced the fully-automatic Blockmaster "3" concrete block machine, designed to produce up to five cycles, or approximately 900 block per min. The machine handles all aggregates and produces various types and sizes of 4, 6 and 8-in. block. The automatic controls (located in a separate dustproof cabinet), when set for the desired cycle, permit the operator to control the machine from his position at the off-bearer.

Its features include an air-operated, two-stage magnetic off-bearer; dual vibration of mold boxes to assure dense packing of aggregates; interchangeable agitator shafts; removable inserts for quick change in block type; an automatic front-end loader which feeds pallets directly into front of machine; and a bottom-drop hopper design for easy cleaning and quick emergency removal of mixes. Mold boxes featuring integrally-mounted twin vibrator shafts and heavy-duty sealed bearings are also supplied with the concrete block machine.

High Capacity Feeder

SIMPLICITY ENGINEERING CO., Durand, Mich., has brought out the bin hung Os-A-Veyor feeder for use in concrete batching plants or ready-mixed concrete operations. It is designed to provide a continuous smooth feed of sand and gravel to the mixing equipment, bucket elevators and belt conveyors, depending on the plant layout. The feeder is available with replaceable liners of abrasion-resistant steel. Two eccentric shafts, coupled to a single V-belt drive, supply the oscillating action. As there is no connection between the eccentric drive and the main frame or bin, overloading is said to cause no damage. Feeder sizes range from 1 x 4 ft. to 6 x 20 ft., with capacities to 1000 t.p.h.

Concrete Mixer Carrier

CRANE CARRIER CORP., Tulsa, Okla., has introduced the "Mixer - Master" carrier, designed specifically for transit-mixer service. It has an all-welded, wide flange H-beam frame. Tied laterally in six strategic locations with braces, the frame is said to withstand torsional loads imposed in mixer service. With an offset cab, 15,000-lb. front axle, and heavy-duty overload type front springs, the unit is said to handle the maximum legal payload.

MIXER MAINTENANCE

42: A producer views the ready-mixed concrete business. This is the second article on truck mixer care

By JAS. A. NICHOLSON

IN THE HANDLING OF A FLEET of mixer trucks, maintenance work should be spread over the week, over the month, and over the year. The top maintenance employe (or head mechanic) should have the responsibility for planning ahead so that each mixer and truck is regularly serviced through properly preventive maintenance routines. Careful planning will sizeably reduce individual truck downtime as well as amount of time garage personnel will have to devote to road calls and breakdowns.

The same key maintenance employe also should be held responsible for checking the kind of treatment that each driver gives to the mixer and truck entrusted to his care. In carrying out this assignment, the top maintenance man should study daily reports from a driver on operating condition of his equipment and regular reports made out by the greaser who lubricates the unit, as well as to personally inspect the mixer truck at every opportunity. Having the top maintenance man make several trips with each driver will prove most helpful in developing better drivers and improving individual handling of equipment.

Written reports and personal observations should give management a good idea of the individual driver's cooperation in keeping his equipment clean, carrying out daily lubrication and other service routines, properly operating the truck mixer, protecting the mixer against job abuses, and reporting on time any need for maintenance work. These checks should also alert garage personnel as to condition of mixer engine, mixing blades, discharge spouts, and water system, as well as to indicate any replacement parts that might shortly be required.

In considering maintenance duties dealing with the care of truck mixers, it is good thinking to break down the mixer into its four principal components:—(1) drum and frame; (2) power and transmission; (3) water system; and (4) hopper and spouts.

Maintenance duties associated with the care of drum and frame include preventing any concrete build-up; checking drum interior; washing down back end of mixer and rear fins; protecting drum rollers; greasing front bearing; building up and replacing mixing blades; checking drum track for cracks; tightening all nuts and bolts on mixer frame; observing condition of bearings; and replacing drum liners.

Principal duties dealing with the care of power and transmission include the following:—insistence upon

Pres., Nicholson Concrete Co., Toledo, Ohio

PREVENTIVE MAINTENANCE PROGRAM FOR TRUCK MIXERS

"L" Services: Completely grease entire unit. Examine chain drip oiler for proper functioning. Check water system for leaks. Check cleanliness of mixer, exterior and interior (report any improper care). Examine discharge chute for free movement and study condition of all chutes.

"A" Services: Do all "L" services and also the following:—check the drum interior and mixing blades for wear and concrete build-up. Examine the water nozzles for any build-up or deterioration. Tighten mounting bolts. Study the drum track for possible development of cracks. Check the oil level in transmission (or right angle gear case). Remove dust from breather cap. Check oil in crank case, add to or change as indicated. Install new filter element in oil filter. Examine spark plugs for proper gap and carbon build-up. Check belts (fan and pump) for proper tension. Service the air cleaner. Check all joints between carburetor and cleaner for tightness. Examine the water system, including pump, valves, and lines.

"B" Services: Repeat all "L" and "A" services and also do the following: — examine the drive chain and sprockets for wear and need for adjustment. Check and adjust clutch (or clutches), inspect and adjust brakes and brake bands. Examine water pump belting, adjust or replace as required. If mixer is equipped with fluid coupling, check oil in coupling—add or refill. Check all transmission and differential oil levels. Adjust carburetor and governor. Check distributor points for setting and pitting. If required, sandblast and reset spark plugs. Check alignment of mixer drum. Rotate drum at agitating and mixing speeds to make sure that proper R.P.M. is being maintained. Make certain that all mixer frame and mounting bolts are securely tightened. Check condition of mixing blades and liners. If mixer is equipped with a closed hopper, check and tighten closed doorseal.

"C" Services: Repeat all "L", "A", and "B" services and also do the following:—tune up the mixer engine. Change the transmission oil. If mixer is equipped with a Donaldson air cleaner, remove and clean wire condenser element. Check drainage from transmission and differential for any cuttings indicating bearing or gear wear. Examine and adjust throttle linkage. Examine and adjust drum rollers and rollers in main bearing to compensate for wear. Check entire unit for welding repair.

"D" Services: (Beginning of summer): Repeat all "L", "A", "B", and "C" services. Put engine in first class condition. Change weights of oil being used. Completely flush out radiator. If mixer has a front entry water system, remove elbow and examine bushings and packing. Do a complete job on drive chain and sprockets (remove chain and use a solvent to flush out all accumulated grit). Replace any worn down or thin mixing blades. Replace any liners that may be required. Go over entire unit. Fix up dents or cracks. Repaint, if necessary.

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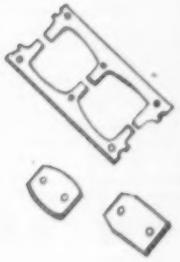
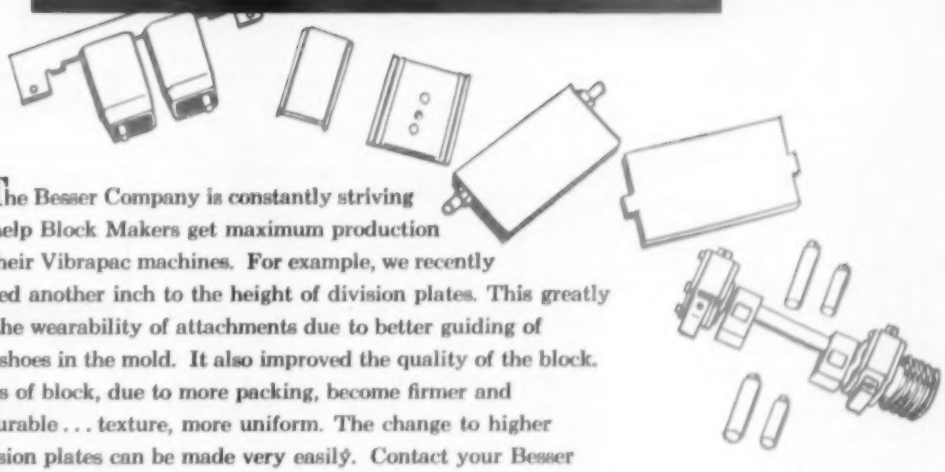
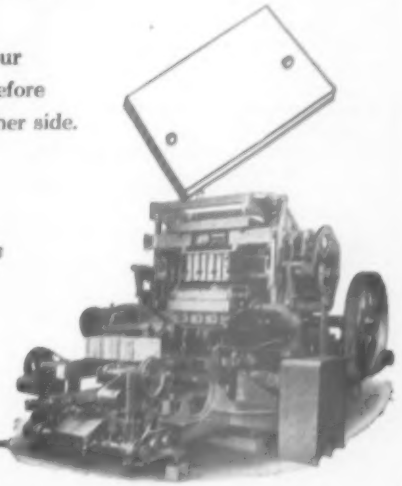




The Besser Company is constantly striving to help Block Makers get maximum production from their Vibrapac machines. For example, we recently added another inch to the height of division plates. This greatly increased the wearability of attachments due to better guiding of stripper shoes in the mold. It also improved the quality of the block. Edges of block, due to more packing, become firmer and more durable . . . texture, more uniform. The change to higher division plates can be made very easily. Contact your Besser representative for details.

Tip to Block Makers — You can get double duty from your cut-off shoes if you change from one edge to the other. Before wearing ⅛" on one side, turn cut-off shoe over and use the other side.



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GENUINE VIBRAPAC PARTS ARE MADE ONLY BY BESSER

Dry mix proportioning and sacking

in one simultaneous operation with a

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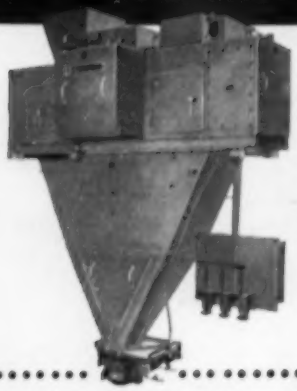

The Richardson Weighblender is ready made for the dry mix concrete industry! Inexpensively solving the weighing, blending, and sacking problems of a fast-moving production line, this unit blends any 3 of various ingredients in a mix (lime, too) at the rate of ten and more sacks per minute. Sack weights may be 25, 50, 80 or 100 lbs. . . . and, they're all *accurately* measured and proportioned.

After precisely weighing each ingredient in the mix, the scales discharge simultaneously, feeding the waiting sacks in a swirling motion for a uniform blend.

These added features complete the scale system and make it applicable to all dry mix operations:

- automatic sack holder when required
- sacks automatically counted and recorded
- bag conveying and sewing equipment available
- single unit E-50 bagging scales available where batching and mixing equipment are already at hand.

Send for Product Data Sheet #6041 for complete information.

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MATERIALS HANDLING BY WEIGHT SINCE 1902

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Branch offices in principal cities in the U.S. and abroad.

MIXER MAINTENANCE

(Continued from page 154)

proper daily preparations (e.g., warming up engine and checking oil pressure); examination of chain oiler and chain; avoiding engine idling; "revving" up engine during loading to eliminate carbon buildup; checking all oil levels; changing oil filter element; servicing air cleaner, spark plugs, and distributor; checking fluid coupling (if unit is so equipped); adjusting clutches and brakes; examining battery cables; tuning up and rebuilding engine.

Proper care of the water system requires that the water pump never be operated when there is no water in the system; lines, pump, and valves drained daily at the end of each cold weather operating day; proper water levels maintained; water pump regularly oiled and otherwise serviced; pump belt tightened; water inlet elbow greased; water nozzles regularly examined for deterioration; the water system checked for leaks; and steps regularly taken to assure full pressure and volume.

Principal maintenance duties involving care of hoppers and spouts require proper handling by a driver on his daily trips and careful attention by garage personnel. Chutes must be kept clean and protected against damage; the chute support must be daily lubricated; doorseals on closed end hoppers must get daily lubricating attention, preferably after each unloading. On the job, before starting to discharge a load, the chute should be wet down; while unloading, the chute should be protected against mistreatment; after unloading, the chute should be cleaned up with water, scraper, and broom. In the garage, new liners should be installed on worn spouts and chutes; door seals must be carefully checked and serviced.

In truck mixer maintenance, faulty performance of the mixer engine is likely to be the chief offender on breakdowns, downtime, and unnecessary avoidable expense. On the construction job, dirty, worn, and damaged condition of discharge chutes is apt to be giving the producer a black eye with the workmen and the contractor - customer. In processing concrete, worn down mixing blades prevent the production of a quality product.

All ready-mixed concrete producers are troubled more or less with such problems as dirty mixers, concrete buildup in drum, delivery of poor concrete due to worn mixing blades or leaking water valves, concrete leaking through sprung doors, loss of grout between chute sections, excessive en-

(Continued on page 159)

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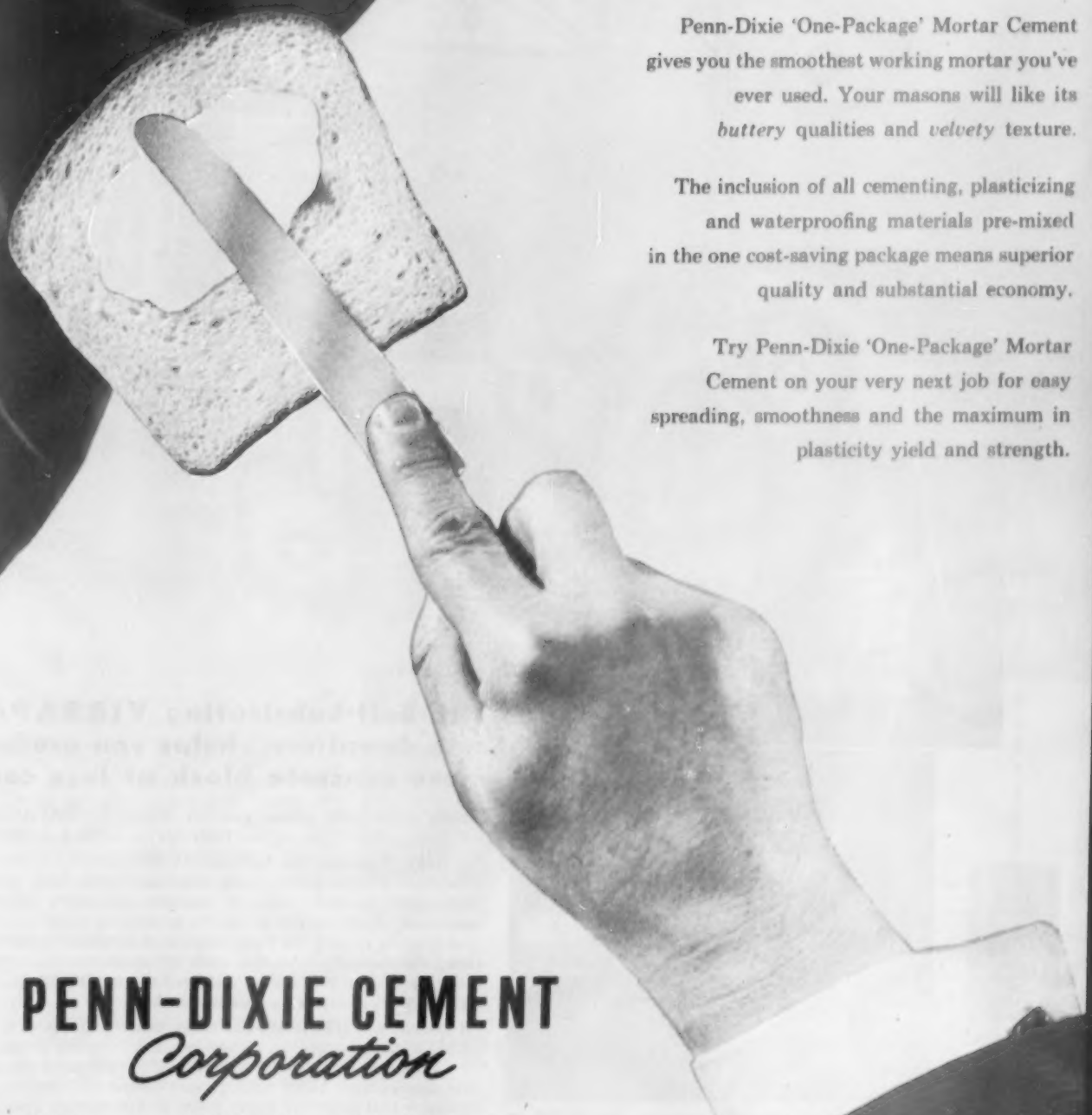

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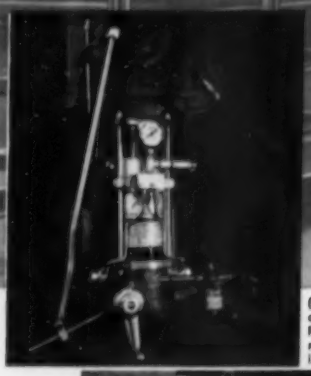
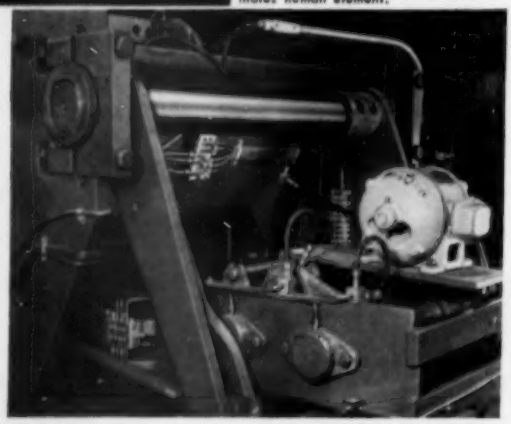


(Left) Positive-feed pump mounted on outboard bearing support of VIBRAPAC machine. Starts and stops automatically with VIBRAPAC . . . eliminates human element.

Signal light indicator at pump. Shows all bearings have been properly lubricated.



Distributor junction blocks with lubrication lines installed on VIBRAPAC. Shows master feeder assembly and ¼" tubing for automatic lubrication of bearings.

The Self-Lubricating VIBRAPAC cuts downtime...helps you produce more concrete block at less cost.

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Of course, a VIBRAPAC has many other features that only BESSER can give you . . . more power . . . more production . . . smoother, high-speed operation . . . pin-point precision that assures finer block with greater output . . . rugged construction that provides many years of satisfactory operation.

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First in Concrete Block Machines!

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MIXER MAINTENANCE

(Continued from page 156)

gine idling, reduced water pressure, loose mounting bolts and mixer misalignment. All these and many other nuisance problems can be greatly minimized, even eliminated, through proper care by drivers and garage personnel. Driver responsibilities have been previously discussed. In this article, we are primarily concerned with the work and routines of maintenance employes.

A suggested Preventive Maintenance Program is listed in a box in the first part of this article. A number of duties connected with truck mixer care were later listed and briefly discussed. Some of these duties will have to be performed more frequently than others. As completely as possible, these duties should be handled at the same time that the truck is being given maintenance attention. If the truck is in for major repairs, it would be wise to use this forced downtime to give the mixer a good "going over". If truck is garaged for "L" and "A" maintenance services only (see article on Truck Maintenance) a reduced amount of maintenance work (unless major repairs are necessary) should be done on the mixer so as to get the equipment rolling as soon as possible.

As discussed under truck maintenance, new equipment, manned by careful, competent drivers, should require less maintenance attention. Cleaning, lubricating, checking, and minor adjusting will generally suffice. Older truck mixers will require additional adjusting, tightening, repairing, parts replacing, and overhauling. B, C, and D services will be required more frequently. Each fleet superintendent (or head mechanic) has the responsibility of planning a preventive maintenance program that is geared to the needs of his equipment.

Drum and Frame Problems

In the ready-mixed concrete industry, the most overlooked maintenance activity is proper care of mixing blades. Another job frequently avoided is removal of hardened concrete from inside the mixer drum—out of sight, out of mind. A producer who demands efficient mixing blades and clean drums is most certainly a quality-minded, cost-conscious operator. Should producers take the time to inspect drum interiors, I am afraid that many of them would find excessive concrete buildup and blades so badly worn down that the production of a full load of quality concrete is virtually an impossibility.

While concrete build-up in the mixer drum is a maintenance problem that

(Continued on page 162)

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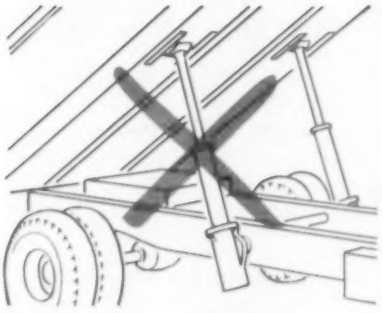


Koehring Dumptor® *has no body hoist*

Operator drives up, trips the body-release lever — and *gravity* tilts the 6-yard body 70 degrees. One second later the load is out, and Dumptor is on its way back for the next load. It's as simple and fast as that!

There's no 15 to 25-second wait for slow-acting body hoists — no expensive hoist replacement parts, maintenance or down-time. And, you get the same one-second dumping *every time,* under heaviest loads, in all temperature extremes, because Koehring *gravity-dump* never balks — never wears out.

One-second dumping earns a substantial increase in yardage output, too. For example — take a typical 1,000-foot haul where you would normally make 16 trips an hour. By saving an average of 20 seconds dump-time on each trip, Dumptor gains 320 seconds, or 5.3 minutes more productive haul-time per hour. You get 17½ trips, instead of 16. This, alone, adds 9% to hourly production.

This saving is typical of Koehring Dumptor's basic principle — to reduce all non-productive time to a minimum — to increase work-time for more yards per day. See Koehring distributor for complete information.

KOEHRING COMPANY

MILWAUKEE 16 WISCONSIN

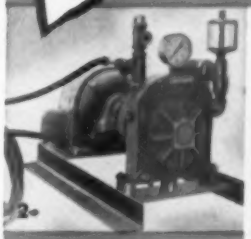
CE644

Subsidiaries: JOHNSON PARSONS KWIK-MIX

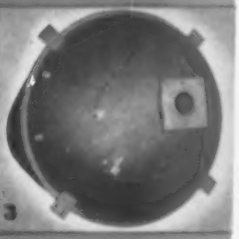
HAVE YOU OVERLOOKED ANY OF THESE IDEAS?

There are places in your batching and mix plants where these low-cost Johnson accessories can profitably increase efficiency on the storage and batching of aggregates and cement . . .

1 **Pivoted Distributor** feeds aggregates into multiple section bins. It turns and locks into position by ground-level control.

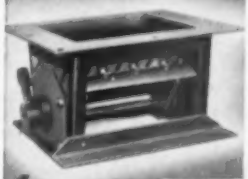


2 **Rotary Vane Compressor** supplies 7 cu. ft. of air pressure per minute to aerate cement silos and bins. Has 15-pound limit-relief valve.

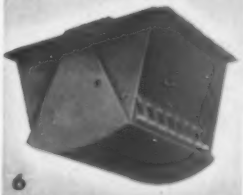


3 **Aeration Fittings** properly spaced in storage silos and tanks keep bulk cement fluid and free-flowing at all times.

4 **Bin Gauges and Signals** accurately register "hi-lo" levels of aggregates or cement. They are dust-proof . . . operation is automatic.



5 **Rotary Plug Valve** controls flow of cement from silos into screw conveyors. It's also used as a fill valve in cement batchers.

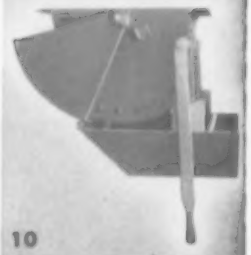


6 **Aggregate Fill Valves** single-clam, radial-type, have shaker weights for jam-proof closing with large aggregates. Hydraulic pressure lub.

7 **Receiving Hoppers** all sizes, types for box-car, hopper-bottom car, truck, or bag delivery of cement. All-welded, weather-tight.

8 **Elevator Buckets, Chains** 2 types, 7 sizes of buckets for aggregates and cement. Long-life steel chain has carburized knuckles.

9 **2-Way Elevator Discharge Valve** is a flap-type chute which directs flow of cement from elevator into bin storage tank, or silo.



10 **Tunnel Gate** a single radial clam gate for stockpile reclamation. Skirt board is hinged, opens and locks in any position.

11 **Chain Sprockets** 19-tooth chilled-rim cast iron with heavy split hub and double-rim lugs. Also, 12-

Mail to: C. S. JOHNSON CO. CHAMPAIGN, ILL. (Koehring Subsidiary)

Send us details on items checked: 1 2 3 4 5 6 7 8 9 10 11

NAME _____

TITLE _____

COMPANY _____

DIVISION _____

STREET _____

CITY, STATE _____

RP 21

Your Customers will say...

Made by Williams, this is the broadest selection of fine Cement and Mortar colors on the market. By offering your customers a choice of 23 shades, you can quickly and easily settle upon one having the exact chemical and physical properties your color specification requires.

CEMENT COLORS BY WILLIAMS

Here you have a choice of 18 shades —6 Reds, 3 Greens, 3 Browns, 3 Yellows, 1 Black, 1 Blue, and 1 Orange. Each shade is manufactured to meet the most exacting specifications for cement work—as recommended by the American Concrete Institute and the Portland Cement Association.

MORTAR COLORS BY WILLIAMS

Here you have a choice of 5 different shades — one shade in double strength red, light buff, dark buff, chocolate and black. Each of these colors may be used with excellent results with any standard mortar mix or with a ready-made Bricklayer's Cement.

Write today for color samples and complete technical information on how Williams Cement and Mortar Colors give you superior results. Address Dept. 10, C. K. Williams & Co., Easton, Pennsylvania.

WILLIAMS
COLORS & PIGMENTS

C. K. WILLIAMS & CO.
East St. Louis, Ill. Easton, Pa. Emeryville, Cal.

MIXER MAINTENANCE

(Continued from page 159)

is primarily the responsibility of the individual driver, an inspection of the drum should accompany every lubrication by the greaser and every equipment check by the head mechanic or other responsible maintenance employe. Drum build-up should never be tolerated. Removal of hardened concrete during the daily cleaning of truck mixers should be a "must". As soon as possible after discovery of build-up, the guilty driver should be given the unpleasant task of chipping out the drum.

The man in charge of delivery equipment should point out to all drivers that additional care of the drum interior is required whenever the mixer is handling low slump concrete. Unless the drum is given a good cleaning after the discharge of each load, the inside of the drum will be in bad shape by the end of the operating day.

Build-up is possible with delivery of the first load of concrete in a new truck mixer. Many producers insist that before handling any concrete, the mixer be partially filled with either stone or gravel. With rapid rotation of the drum, the revolving aggregate will remove weld marks that might tend to hold up concrete and start a build-up problem.

The careless operator who permits build-up and a bad blade condition is almost certain to be guilty of harmful overloading practices. He is not one to worry about how many cubic yards a unit will mix efficiently; with him its how much concrete can a mixer hold. This sloppy, over-loading producer seems to believe that a truck mixer can mix everything it can hold regardless of how much the unit is overloaded or how badly worn are the mixing blades. He will order removal of hardened concrete from the drum only when the build-up condition is so bad that the mixer capacity is reduced; he will restore worn mixing blades by welding only when concrete is rejected at a job.

In revolving truck mixers, the drum has a diameter of 70 to 90 in., with mixing blades approximately 10 in. high, along the sides. Efficient mixing depends on the ability of the blades to pick up sufficient concrete along the sides and dump it in the middle. Short blades simply can't carry up enough concrete to do an efficient mixing job. When blades are worn down, there is too much concrete rolling around the middle that gets little mixing action. For short worn blades to mix efficiently, the size of the loads must be cut down. Too few producers are suffi-

(Continued on page 164)

COMMENT
from the BUTLER ENGINEER

Of Ready Mix, Roadbuilders, Blocks and Awards

Very interesting, very gratifying, very sound is the sharp trend toward automation in the concrete products industry . . . When Butler Bin piloted the first completely automatic, one-man operated Roadbuilders Plant we expected the rush that followed. And Butler automatic, electronic batching, led to quick conversions in the Ready Mixed field.

And now we find that the concrete block field has been equally alert to see the tremendous advantages of automation in product control and in production economy.

•

Incidentally, Butler entered the automation field in the right position: first—and we still are.

•

And speaking of Roadbuilders set-ups, one of the fine national magazines, CONSTRUCTION EQUIPMENT, cited the Butler Automatic One-Man Roadbuilders as Product of the Month. This is an award made only after careful analysis and screening by a completely impartial board of judges. We're very proud — but we're *not* in the nose-in-the-air department. Head in the clouds maybe but feet very much on the ground — and determined to win the Award again. A sweeping bow to CONSTRUCTION EQUIPMENT. A martini will be hoisted in thanks by the Butler Engineer at 5:00 P.M. today. Maybe every day.

•

Went to the movies t'other night. Kim Novak in "Picnic". Those who can take their eyes off the delectable Miss Novac, will see a Butler Ready Mix Plant in the background in one scene. You missed the background? I don't wonder.

I'm Kim-minded,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

Cutting costs is the primary function of portable conveyors

To make the greatest cost savings, portable conveyors must:

. . . have quality construction for long life and trouble-free operation. They must be available in the length and capacity range to suit your needs. They must be available with the features and accessories you want—screens, power hoists, pneumatic or steel wheels, gas or electric drives, etc.

They must be easy to move around the yard . . . easily towed from job to job. They must withstand constant use and frequent movement.

Shown above is the portable conveyor of advanced design, the Barber-Greene 363. Shaft and gear reducer drive—no chains—no sprockets, full swiveling wheels, Acme take-ups and many other exclusive features.

Shown below are other models in Barber-Greene's complete line of cost-cutting conveyors.

Model 374 cuts cost at high capacity. With capacities up to 425 t.p.h., this heavy-duty machine has antifriction bearings, shaft and gearbox drive, hydraulic boom hoist and other features.

Model 358 cuts cost of car unloading. Feeding a conveyor, this car unloader releases cranes and other expensive equipment for other work. Handles gravel, sand, stone, cinders, etc.

Model 362—low-cost, high-quality portable. Three-roll carriers, swivel wheel truck, and many other features not available on conveyors of this low-price range, are standard on the 362.

56-8-PO

Write for literature on any portable in the Barber-Greene line.

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

MIXER MAINTENANCE

(Continued from page 162)

ciently quality minded to order a reduction in the amount of concrete delivered per trip.

Some quality conscious producers face the mixing blade problem by specifying the hard facing of blades (some or all) when new truck mixers are purchased. This is an easy but high cost preventive measure. The cost of the additional investment prevents most operators from making this requirement a part of the order. A good many operators place weld (alloy) rod passes, approximately $\frac{1}{16}$-in. high, along both sides of fast wearing blades at the edges. At some plants this is required procedure when the blades are new; at other plants, action follows notice of wear.

Every producer should have a man on his maintenance staff who has the answers on how to build up mixing blades. Most mixer manufacturers agree that it is best not to cut out the old blades completely. It is generally recommended to use an old blade for both support and guidance. The old blade should be cut down to the fillet used to attach the blade to the drum; then the new blade should be welded on, both to the fillet and to the drum. For each make of truck mixer, there is probably a preferred blade replacement procedure. A producer should get from the mixer manufacturer suggested recommendations for handling this important task.

The mixing blades in the big section of the drum are the ones that get the wear and must generally be replaced. All mixer manufacturers — many of them do—should use heavier Manten steel in the blade sections most exposed to wear.

Mixer manufacturers, upon request, will hardface the wearing edges on the mixing side and discharge side of the blades. Replacement fins are sent in sections already formed to be welded on. Blades are also generally provided in sections. Before placing an order, a producer should carefully study each mixer's parts list to make certain that he is getting the necessary replacement blades. Most mixer manufacturers carefully mark new blade and fin sections to aid the maintenance man in making an easy installation.

All ready-mixed concrete operators should realize there is no defense for worn down blades. Any time a poorly mixed load (e.g., presence of cement balls) arrive on a job, an inspector or the contractor should insist upon checking the condition of the mixing blades. If a truck mixer with badly worn blades can't be replaced, the size of the loads should be cut down. Blade life is largely dependent on the abrasiveness of the aggregate being regularly used in the concrete. Unless truck mixer blades are hardfaced, a producer should figure on replacing blades once a year if he wants to process uniform quality concrete.

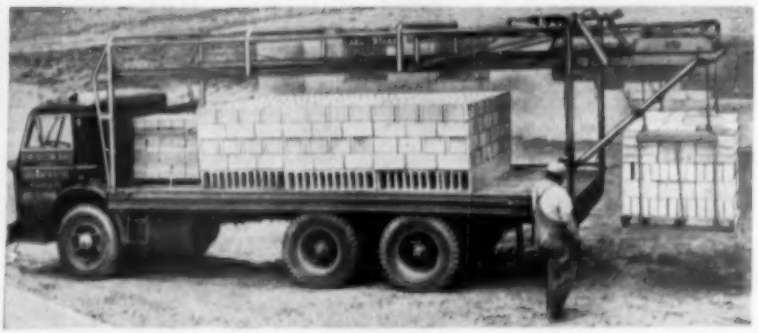
Some producers defer building up blades, figuring they will soon have to reline drum sections and they will do both jobs at the same time. Because it is generally preferable to put liners on from the outside, there is little connection between the two tasks. A key representative of a leading mixer manufacturer once told me that drum reliners can be put on the outside for one-third the cost of relining from the inside.

In the suggested preventive maintenance program, attention to tightening of frame and mounting bolts in both A and B service series was listed. During each of these services, every nut and bolt on the mixer frame should be securely tightened with a wrench. With all the racking and weaving that goes on during job maneuvering, damage will occur to a mixer that has a loose frame. When joints loosen up and the mixer frame begins to work, trouble is certain.

To get snug joints, many of the

(Continued on page 169)

OF COURSE YOU'LL SAVE MONEY
with a
Hydra-Lift Unloader
(Patent 2,751,095--other patents pending)



BERKS BUILDING BLOCK CORP., 2210 N. 5th St., READING, PA., are delivering twice as many blocks per day with this truck since HYDRA-LIFT was installed on it - - - and without breaking or chipping.

UNLOAD TWO CUBES AT A TIME
UNLOAD WITH EASE ON HILLS
UNLOAD INTO BASEMENTS

Phone, Wire or Write for Complete Details

HAVERSTICK BROS.
2111 Stone Mill Road
Lancaster, Pennsylvania
Phone 2-5722

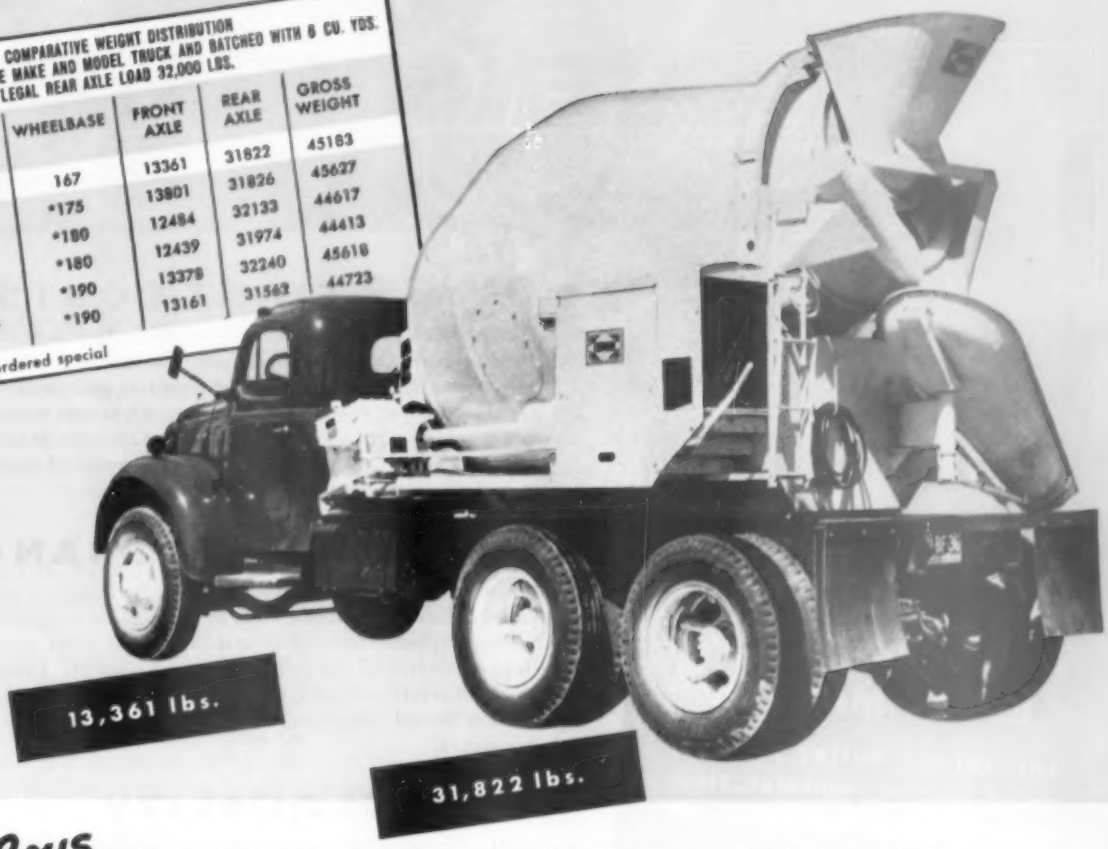
DEALER INQUIRIES INVITED

Compare BLAW-KNOX TRUKMIXERS *with ordinary truck mixers for better weight distribution on* SHORTER WHEELBASE TRUCKS

COMPARATIVE WEIGHT DISTRIBUTION
ALL MIXERS ON SAME MAKE AND MODEL TRUCK AND BATCHED WITH 6 CU. YDS.
LEGAL REAR AXLE LOAD 32,000 LBS.

LOAD ON THE ROAD	WHEELBASE	FRONT AXLE	REAR AXLE	GROSS WEIGHT
BLAW-KNOX	167	13361	31822	45183
MIXER "A"	*175	13801	31826	45627
MIXER "B"	*180	12484	32133	44617
MIXER "C"	*180	12439	31974	44413
MIXER "D"	*190	13378	32240	45618
MIXER "E"	*190	13161	31562	44723

*Must be ordered special



Hi-Boys mount on a more maneuverable, shorter wheelbase truck

WHEN YOU STUDY the table above you can see why Blaw-Knox Hi-Boy TRUKMIXERS can be mounted on shorter wheelbase trucks. Mounting the motor at the rear and the transmission at the end of the combination pedestal water tank, permits center of weight to be moved 20" forward and shortens the overall length. This gives better weight distribution with more weight on front axle so you can carry bigger *legal* payload.

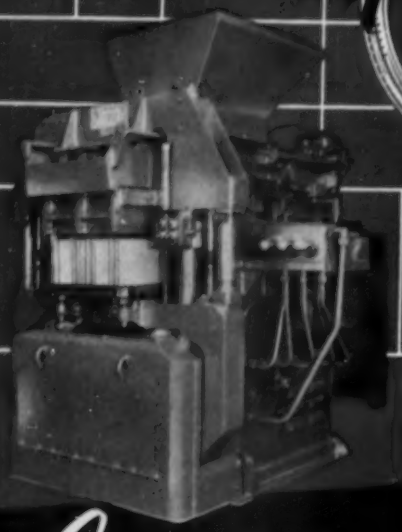
Another Hi-Boy feature that assures better weight distribution and most efficient mixing is the larger diameter drum that mixes even zero slump concrete quickly and keeps the batch weight at the front of the mixer. Pedestal and flush water tanks are also combined to reduce weight by approximately half a ton and lower the center of gravity of the unit. There are dozens of other practical, profitable features in these units you will want to investigate. Call your Blaw-Knox distributor today.

BLAW-KNOX

BLAW-KNOX COMPANY

CONSTRUCTION EQUIPMENT DIVISION
36 Charleston Avenue Mattoon, Illinois

What UP to the MINUTE "ENGINEERING" Means



Columbia's Model 8 FULLY AUTOMATIC BLOCK MACHINE

Including: Pallet feeder, mold, feed box agitator, electronic controls and panel, all motors and switches, pumping unit and electronic height and density control. Ready to work for you...

and the price is just

$10,385

F.O.B. VANCOUVER

Investigate our "Pay as You Depreciate" finance plan. Terms up to 6 years.

LOWER FIRST COSTS

Simplicity of design and construction explains the low initial cost of precision-built Columbia Machines. Positive hydraulic principles eliminate cams, levers, gears, belts, pulleys, gear head motors, shear pins and other costly wearing parts. All factors essential to smooth, trouble-free operation are built into Columbia Machines—making the Columbia line the biggest dollar's worth of machinery on the market today!

LOWER MAINTENANCE

With fewer moving parts to wear out or give trouble, Columbia Machines reduce maintenance costs to an absolute minimum. All parts are completely covered to seal off grit of plant operation. Bearings are oversized and sealed to insure longer life. Columbia's electronic-hydraulic control system provides a protective "cushion" against mechanical stoppages, and halts the cycle automatically if trouble occurs.

HIGHER QUALITY

Columbia Machines are manufactured of the finest material available, with an extra strength factor to guarantee against breakage or distortion. Electronic control gives pinpoint command over every phase in the block-making cycle — including height and density control. Units produced are perfect in size, shape and texture, and reflect the superior qualities of the machine itself.

HIGHER PRODUCTION

The fully automatic Columbia Machine—with its super-fast agitation and short head movement for higher operating speeds—establishes a new standard for production averages. All Columbia Machines operate at 4 to 6 cycles per minute with standard plain pallets. Molds can be changed in 15 to 20 minutes when production is continued on blocks of the same height.

If you are planning a block operation in your area, or would like to add concrete block production to your present business, call us at our expense . . . and we will have a qualified man at your plant within 24 hours. There's no obligation! Phone Clifford 4-7781.

Columbia MACHINE

Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON

Factory Branch and Warehouse at Mattoon, Illinois.

District Offices in: Wisconsin, Illinois, South Carolina, Mississippi, Florida, New Jersey, Virginia, California, Massachusetts, Texas, Montreal, Toronto, Vancouver, B. C.

Concrete Marquee

PRESTRESSED CONCRETE, INC., Lakeland, Fla., cast and erected the prestressed concrete marquee for Wakeman Corp. also of Lakeland. It is estimated to cost $ 1 per sq. ft.

The roof deck is formed by double T-beams of prestressed concrete in units 40 x 4-ft. with a 10-ft. overhang.

Attractive marquee covers equipment display

The supporting concrete bent was poured in place. It is felt that these units have great possibilities for service stations, drive-in banks, bus depots, roadside restaurants, shops, etc. Food Machinery and Chemical Corp. fabricated the steel casting forms for producing the prestressed beam units.

Western Meeting

WESTERN CONCRETE PIPE ASSOCIATION, held its annual meeting in Fresno, Calif. Over 100 pipe manufacturers attended. Directors elected for three year terms were: Hugh Bennett, Bennett & Bennett; Harrell Gannaway, Concrete Pipe Co.; H. A. Marks, Medford Construction Co.; and Charles E. Ward, Utah Concrete Pipe Co.

Howard F. Peckworth, managing director of the American Concrete Pipe Association, talked at length on specification changes and various other matters. Henry A. Weigand, Concrete Conduit Co., discussed a survey of Los Angeles sewers being made by Los Angeles City Bureau of Standards and other parties. This survey shows that the concrete pipe sewers which were installed during the 30's are in generally excellent condition. E. L. Howard, chief testing engineer, Pacific Coast Aggregates, talked about the problems of grading and screening aggregates for use in concrete pipe manufacture. W. L. Donley discussed the use of concrete pipe in heating systems under the concrete floors of general utility buildings. Charles Parker pointed out some of the legal difficulties that arise from uncontrolled storm and flood waters and the problems that various agencies have in preparing for floods and handling the waters as they develop.

Faced Concrete Block

SOCIETY OF CONSTRUCTION SUPERINTENDENTS, New York, N.Y., recently learned about a new development in faced concrete block. President George Kogle, Cincrete Corp., cited recent developments in the industry which he feels challenge the use of prefabricated metal panels in low-cost building construction.

Vitricon, a cold glazed cement finish, is the most recent facing material for concrete block. It does not require molding or casting but is sprayed on the block.

Now . . . Columbia Heavy Duty Standard racks can be shipped to your plant within a few days after your order is received. Columbia can also custom design racks from your blueprints or measurements to fit your special plant requirements.

Racks are ruggedly constructed of high quality steel for all pallet and block sizes...and can be shipped sub-assembled for compact delivery and easier handling.

Send dimensions for your rack requirements to Columbia's engineering department. You will be furnished with prices at no obligation.

TURNTABLES

Ask about Columbia's new one, two and three-rack motor-driven "push-button control" turntables. Also available in manual, semi-portable and fixed position combinations.

District Offices in: Wisconsin, Illinois, South Carolina, Mississippi, Florida, New Jersey, Virginia, California, Massachusetts, Texas, Montreal, Toronto, Vancouver, B. C.

Columbia MACHINE
Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON
Factory Branch and Warehouse at Mattoon, Illinois

This is the 131st of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

Another BESSER BOOSTER

Husband and Wife Team Builds Successful Block Business in Detroit Area with VIBRAPACS

The history of Concrete Block & Products Company, Detroit, Michigan, has all the aspects of a typical Horatio Alger success story. This time, however, the hero is a husband and wife team, Mr. and Mrs. Walter A. Kurtz.

In 1937, the company employed only seven people and operated two trucks. Sales amounted to approximately $140,000. Today the company has more than one hundred employees, operates 40 trucks and the sales volume has been boosted to almost two million dollars. Much of their phenomenal success can be attributed to the energetic personality of Mrs. Kurtz, who takes an unusually active part in the management of the firm. They say Mrs. Kurtz would rather go shopping for a new truck than a mink coat.

Another factor in the company's success is the exclusive use of Besser Vibrapacs in producing quality block. A Besser machine was installed when the company was organized in 1924, and the Kurtz team stuck to Besser in all the ensuing years. A front pallet feed Vibrapac was installed in September, 1955. As Mrs. Kurtz puts it, *"It is our opinion that the Besser Vibrapac gives the best service obtainable".*

Why don't you, too, team up with Besser for greater production of high quality block. Ask a Besser representative for literature, or write:

BESSER COMPANY
Complete Equipment for Concrete Block Plants
BOX 133, ALPENA, MICH., U.S.A.

Mrs. Kurtz conferring with husband Walter Kurtz. Both have been active in the business since the company's inception.

Besser Vibrapac in Concrete Block & Products Company plant. Off-bearer has just removed green block with power hoist. No manual lifting.

Stockpiles of aggregate and sand at River Rouge dock owned by Concrete Block & Products Company. Conveyors bring materials through tunnels from heart of pile.

Exterior view of Martin Avenue plant. A second plant, on a 7½ acre site, was acquired about a year ago.

BESSER
VIBRAPAC

first in concrete block machines

A 8774-1FBC

MIXER MAINTENANCE

(Continued from page 164)

frame bolts of a new mixer are fitted tightly into reamed holes. Long shanks are used to get solidly filled holes. The effect of loose bolts is to lengthen out the holes, making tight fits impossible —even with new bolts and nuts. When this happens, more frequent tightening of the frame bolts is the only recourse.

On condition of equipment, here is a case in point. A large western producer had been making profitable daily use of truck mixers that were ten years old These mixers were always well painted and were maintained daily in as good condition as possible. The reamed holes in the mixer frame had lengthened out and daily tightening of the nuts and bolts by the night crew was a necessary chore. In the purchase of new equipment, these aged mixers were turned in at a good price for units that were so old. Several small operators, situated in the same general area, who were unacquainted with the frame loosening problems, bought these used mixers and proceeded to give them continued hard usage, but eliminated the daily maintenance attention.

In a relatively few weeks, all these old mixers were a bunch of junk. Because they didn't have a maintenance program geared to the actual operating condition of the newly purchased, but old truck mixers, the new owners of this old equipment took a good financial licking. Old beat-up drums don't belong in anybody's fleet of truck mixers.

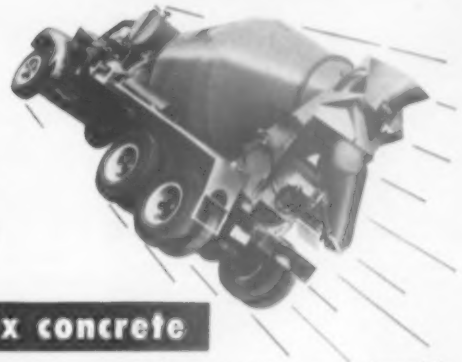
Although drum revolution is principally a problem of power and transmission, this operational phase is important enough to be given consideration under drum care. There is an individual drum speed that is best for loading, mixing, and discharging a given load of concrete. In loading, plant conditions may determine whether a drum should be rotated at mixing speed or at full throttle setting. The flow of materials from the weigh hopper should be so regulated that the material pours through the charging hopper in a steady stream into the drum. The consistency of the mix might be the determining factor on proper r.p.m. during mixing and discharging. In discharging low slump concrete, it might be necessary to go to a slow r.p.m. To avoid segregation, the discharge door should be opened wide. Partial closing of the discharge door to slow down rate of concrete discharge from the mixer is bad operating practice.

The appearance of cracks in the drum track or flat spots on drum rollers is apt to lead to downtime expense early replacement of drum rollers. Both

No — the New ROCKET will NOT fly to the moon

25th Anniversary

That's right.
And for the sake of honesty in advertising, there are other things the Rocket will not do. It will not operate satisfactorily under water; it will not quadruple your profits within 24 hours; the Rocket's rate of charge will not exceed the speed of sound. The new Rocket will not compete in the 1957 Olympics as a member of the interplanatory space squadron.



But it WILL mix concrete

It will mix it quickly and properly under the most adverse conditions. It will also agitate quite successfully.

Owners (of Rockets) tell us this mixer (1) requires surprisingly little maintenance, (2) has every ease-of-operation feature (at no extra cost).

We honestly believe you'll agree that the Rocket is a fine mixer at a reasonable price that will give you better-than-average performance for a long, long time. *There's a Rocket to fit every Pocket(book), too.*

Demand the Badge of Dependability

ALL THESE FEATURES at NO EXTRA COST!

Hydraulic Chute Control is fully automatic. Controls grouped for easy access.

Aluminum Extension Chute attaches to 36" fold-over addition to main chute. Total discharge chute: 12' 6".

Electric Revolution Counter kit included, you can handle most specifications with the Rocket!

Special Alloy, abrasion resisting steel used at all wear points.

Unobstructed Hopper, for rapid charging, no spilling or waste.

Positive Chain Drive, flexible power, not affected by truck twist, road shock.

Standard Industrial Engine, truck-type transmission. Repair parts readily available.

Three-Point Suspension, one-piece cast steel precision machined ring.

CONCRETE TRANSPORT MIXER CO.

4067 FYLER AVE., ST. LOUIS 9, MO.
FLanders 2-7000

MAIL THIS COUPON TODAY!

Gentlemen: Please rush full information, prices and terms on the following

- ☐ New Rocket Revolving Drum Truck Mixer
- ☐ Hi-Lo Stationary Drum Mixer
- ☐ Batching Equipment ☐ Water Meters
- ☐ Material Handling Equipment

CP

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WHAT ARE YOU PAYING FOR REPAIRS?

The money you are paying to keep worn-out equipment working may be just enough for you to own better equipment.

See the **"WHERE TO BUY"** *Section*

For
BETTER STRONGER WALLS
USE WAL-LOK IT BONDS BETTER
Mortar Joint Reinforcing

THE WAL-LOK WAY

When a mason uses reinforcing in a masonry wall, he lays the reinforcing right on the last course. With WAL-LOK, Cross Rods are welded across the Side Bars. The mason puts WAL-LOK on the wall with the Cross Rods DOWN.

The Cross Rods hold the Side Bars up away from the blocks and the mortar completely surrounds each Side Bar. With WAL-LOK, the mortar grips all the way around!

All WAL-LOK is also deformed and knurled for a positive bond the full length. All this still permits a quarter inch mortar joint.

THE WRONG WAY

With ordinary reinforcing, where all the wires are butt-welded in one plane, the Side Bars rest right on the blocks. The mason puts on his mortar. Steel doesn't float, so the mortar can't get under the Side Bars and the mortar bonds only to the top and sides.

WHY EXPECT MORTAR TO DO SOMETHING YOU CAN'T DO?

When you try to hang onto a rod, you don't hold it with your finger tips. You grip it in your fist with your fingers wrapped all the way around.

Why gamble—on cracked walls or wall failures. WAL-LOK costs so little yet adds so much to the strength and value of the structure.

WRITE TODAY for your copy of WAL-LOK's new folder showing sizes, specifications and test results.

WAL-LOK
ADRIAN PEERLESS, INC.
1481 E. Michigan St.
Adrian, Michigan

the driver and the greaser should be alert for flat spots and cracks. An experienced welder can handle the crack problem. If a roller locks from grout buildup, the roller track will wear a flat spot on the roller. Insistence upon clean equipment is the best preventive to sizeable roller replacement expense. Several mixer manufacturers advise over-greasing of rollers to keep them free of foreign matter. In the care of drum rollers, daily cleaning and greasing are the cost of avoiding higher maintenance bills.

Our preventive maintenance program calls for periodic inspection and adjustment of drum roller bearings. Periodic adjustments to take up play in the bearings resulting from wear should be made in accordance with manual instructions. When play cannot be eliminated by adjustments, worn bearings should be replaced. Many producers operate different makes of mixers. Procedures for adjusting and replacing drum rollers may vary from one make unit to another.

PRESTRESSED CONCRETE

(Continued from page 152)

In his prestressing wire specification, Mr. Godfrey proposed that each seven-wire strand be composed of a center wire and six outside wires, the center strand to be large enough so that all outside wires will bear on the center wire, thus gripping it. During fabrication wires may be spliced in accordance with best welding procedure, but no splice shall be made within 150 ft. of a splice in another wire. In the finished strand the six outer wires shall have a uniform pitch of not less than 12 and not more than 16 times the nominal diameter of the strand. All strands shall be stress-relieved as a unit after the wires have been formed into a strand.

The wires, it is proposed, shall be be of carbon steel having an analysis in the following range: Carbon, 0.70 to 0.85 percent; manganese, 0.40 to 0.90 percent; phosphorous, 0.054 percent max.; sulphur, 0.050 percent max. Strand properties shall conform to the following table:

Strand Diameter	Approx. Area Sq. In.	Min. Ult. Strength lbs.
3/8 in.	0.0556	9,000
7/16 in.	0.0578	14,500
1/2 in.	0.0799	20,000
9/16 in.	0.1089	27,000

The minimum yield strength, measured by the 0.2 percent offset method, shall not be less than 85 percent of specified minimum ultimate strength. The elongation of the strand shall not be less than 4 percent in 24 in. The elongation to be determined as the percent increase between the jaws of the testing machine from the position after application of the initial load to the position at the initial failure of the test specimen. The separation of the jaws of the testing machine shall be approximately 2 ft. when under an initial load equal to 10 percent of the required minimum breaking strength of the strand.

Thor Germundsson of the Portland Cement Association said that the association has been able to get prestressed concrete approved, at least temporarily, in most city codes.

A report was given by Thor Germundsson of the Portland Cement Association on the work of the ACI-ASCE joint committee 323 on recommended practices for prestressed concrete. He discussed such phases of the report (not yet final) as allowable stresses in wire and concrete; various losses in prestress forces; ultimate moment calculations; acceptance tests for prestressed concrete members; ultimate load factors; special load factors; calculation for bridge decks, etc.

Carl E. Ekberg of Lehigh University, Bethlehem, Penn., discussed "The Characteristics of Prestressed Concrete Under Repetitive Loading." He described tests of 55-ft. and 70-ft. beams which were made at Lehigh, showing motion pictures.

Curzon Dobell of the Preload Co., New York, made out a strong case for prestressed concrete in his paper, "Structural and Economical Advantages of Prestressed Concrete for Large Span Bridges." He said that about 50 bridges have already been built in Florida of prestressed concrete at costs lower than steel and, in fact, lower also than the cost of prestressed in some other parts of the country. Looking to the future, Mr. Dobell said that longer spans will be necessary to compete with steel. In constructing these long spans, he said that cast-in-place operations will have an economic advantage over pre-cast, pre-tensioned manufacturing in a yard.

H. J. Godfrey of John A. Roebling's Sons Co., Trenton, N. J., read a paper on "The Physical Properties and Methods of Testing Prestressed Concrete Steel Wire and Strand."

W. E. Dean, bridge engineer, Florida State Road Department, had as his subject, "Comparative costs of Prestressed Construction and Conventional Types in Trestle Spans of Florida Bridges." Mr. Dean said that recent price advances in fabricated structural steel have given prestressed concrete a greater price advantage.

Dr. R. W. Kluge, head professor of civil engineering, University of Florida, described tests now being conducted for the State Road Department on six girders in the Skyway bridge over Tampa Bay, four girders in the recent-

(Continued on page 174)

These three Mack model B421S concrete mixers are part of the big San Mateo Feed & Fuel Company's fleet. Macks have helped set the pace for their growing operation since 1951.

compared to all other makes in our fleet . . . MACK's performance and maintenance records were outstanding . . . that's why we bought 35 more

—R. C. Hughes, President
San Mateo Feed & Fuel Company
San Mateo, California

Proof of performance is what Mr. R. C. Hughes, president of San Mateo Feed & Fuel Company, demanded before buying 35 new Macks—21 model B421S mixers, and 14 model B30P dumpers.

"We relied on our records," commented Mr. Hughes, "when the time came to make a major decision for modernizing our fleet. The answer was clear . . . in our mixed fleet Macks were the stand-outs for fuel economy, low maintenance cost, and over-all earning capacity.

"We bought our first six Macks in 1951, and added 14 more in 1952. Now, with the addition of 35 new units, our fleet contains 55 Macks. We consider our big investment in Macks an important factor in building increased profit into our rapidly growing business."

Get the facts on Macks before you buy another truck. See your Mack Branch or Distributor and find out how Mack can give you top performance and economy in every trucking operation.

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MACK TRUCKS, INC., Plainfield, New Jersey. IN CANADA: Mack Trucks of Canada, Ltd.

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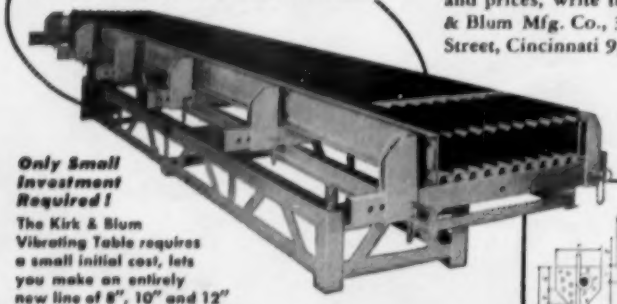
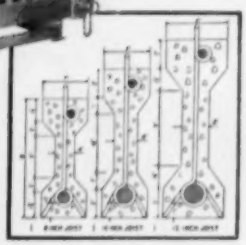
PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3210 Forrer Street, Cincinnati 9, Ohio.





Only Small Investment Required!

The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

KIRK & BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

AUTOCLAVES

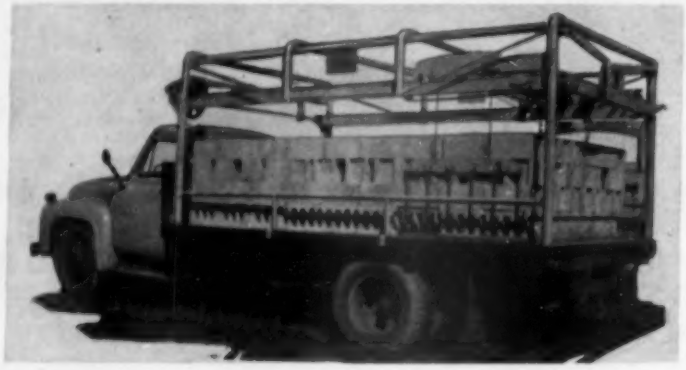
(Continued from page 146)

with a contour rack than with either a 72-block or 108-block standard rack. For example, the 72-block standard rack required 97-in. diameter autoclaves. By increasing the diameter to 104 in., a gain of 30 block per rack was achieved. On the other hand, the 108-block standard rack would have required 120-in. autoclaves. An increase of 16 in. in autoclave diameter would have achieved a gain of only six block per rack. The final diameter of 106 in. with the 2-in. extra allowance was chosen to permit the company later on to autoclave 12-in. high units.

Another important addition to the plant was the doubling of the central research laboratory to 2200 sq. ft. The laboratory is operated for the entire Concrete Division of Texas Industries, Inc., which operates 30 other plants in Texas, Louisiana, Oklahoma, Kansas and California.

Cubing of block has been mechanized with four Besser air hoists to transfer block from the autoclave racks to a conveyor belt. A new truck maintenance building has the latest equipment for motor tuning and all types of repairs. This building also is a warehouse for accessory items sold by Texcrete.

THE GUNCO HYDRO-LIFT UNLOADER



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THE MODERN WAY TO DELIVER BLOCKS

EXCLUSIVE FEATURES OF THE GUNCO HYDRO-LIFT UNLOADER

Positive power by engine power take-off.

Removable guard rails—one man operation.

Folding rear end optional, no obstruction below rail.

Can easily be removed, truck can be used for other purposes.

Has been road tested three years.

Positive chain drive.

Trolley carrying hoses—no binding or rubbing.

Can be installed on trailers any length desired.

Can be shipped anywhere.

For further information Write or phone collect

G. & H. MACHINE COMPANY

P.O. Box #38, Columbia, Penna. Phone Columbia 4-2352 or 4-4711

THE ORIGINATORS AND MANUFACTURERS OF THE GUNCO HYDRO-LIFT UNLOADER

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HANDI-CRETE

- DEHYDRATED
- PRE-MIXED
- PACKAGED
- CEMENT PRODUCTS

More than 20 million bags of packaged dehydrated materials for making concrete will be sold in 1956! Handi-Crete offers you everything you need to get your share of this profitable market. Territories are still open for exclusive manufacture of Handi-Crete. Some distributorships also available.

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Elsewhere in this issue is a special card to make it easy to subscribe for a friend or employee. Why not pass along the card to people you think should be reading **ROCK PRODUCTS** every month.

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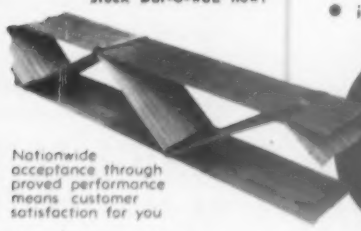
• Architects specify Dur-O-wal. Builders demand Dur-O-wal. Dealer SALES on Dur-O-wal reach new highs with every season. CUSTOMER SATISFACTION couldn't be better! Yes, proved performance and economy in masonry walls the country over are the reasons why Dur-O-wal is a fast turn-over, big sales volume item for you. Stock Dur-O-wal now!



Nationwide acceptance through proved performance means customer satisfaction for you

EASY TO STOCK, STORE TO USE AND TO SELL

Trussed Design
Butt Weld • Deformed Rods

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Write Dept. 6T today for complete information, specifications, prices and the name of the Dur-O-wal distributor nearest you.

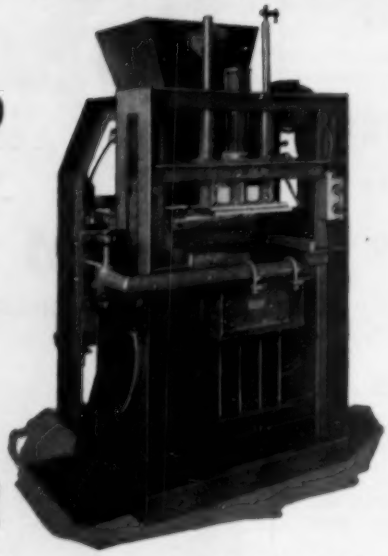
Dur-O-wal Div., Cedar Rapids Block Co., **CEDAR RAPIDS, IA.** Dur-O-wal Prod., Inc., Box 628, **SYRACUSE, N.Y.** Dur-O-wal of Ill., 119 N. River St., **AURORA, ILL.** Dur-O-wal Prod. of Ala., Inc., Box 5446, **BIRMINGHAM, ALA.** Dur-O-wal Prod., Inc., 4500 E. Lombard St., **BALTIMORE, MD.** Dur-O-wal Div., Frontier Mfg. Co., Box 49, **PHOENIX, ARIZ.** Dur-O-wal, Inc., 165 Utah St., **TOLEDO, OHIO**

"BIG TIME" ADVANTAGES

IN THIS COMPACT AND RELATIVELY INEXPENSIVE

KENT

SUPER BLOCKMAKER



Here is an entirely new semi-automatic machine ideally suited for SMALL and MEDIUM block plants.

A SPECIAL air cylinder-powered press head makes possible a faster cycle and assures blocks of uniform height and equal density regardless of the material used.

PRICED BELOW any machine of comparable performance, the SUPER BLOCKMAKER consistently produces blocks at a rate of 5 per minute from any aggregate and has a peak output of 6 blocks per minute.

Equal delivery of aggregate to the mold box is effected by agitation and mold box vibration assures uniform block density.

A simple push of a button starts cycle during which various operations are automatically handled in sequence.

You'll be surprisingly pleased at the comparative low cost of this machine. Write TODAY for illustrated circular.

The **KENT MACHINE COMPANY**

CUYAHOGA FALLS, OHIO

CONCRETE PRODUCTS MACHINERY SINCE 1925

ROCK PRODUCTS

THE

Recognized Authority

OF THE

Non-Metallic Minerals Industry

PRESTRESSED CONCRETE

(Continued from page 170)

ly completed Gandy bridge near St. Petersburg, two girders in the Hardaway Construction Co.'s yard at Port Tampa and two girders in the structural laboratory at the University of Florida. These girders are about 50 ft. long, about 3½ ft. deep and are post-tensioned and pressure grouted. Other prestressed products are also undergoing study at the university.

Dr. T. Y. Lin of the Univerity of California, one of the foremost authorities on prestressed concrete, discussed "The Economics of Prestressed Concrete," in which he made the point that the use of prestressed concrete will grow much faster than other construction methods. At a cost of about 10 percent additional, he said prestressed concrete gives five to seven times the strength of reinforced concrete.

On the ground floor of the Hollywood Beach Hotel were a number of exhibits. The exhibitors were: American Steel & Wire Division, U. S. Steel, John A. Roebling's Sons Corp., Union Wire Rope Corp., the Florida Division of Food Machinery & Chemical Corp., the Bucyrus-Erie Co., Precision Devices, Inc. (New York) and Plant City Welding & Tank Co. (Plant City, Fla.).

DRY MIX PRODUCTS

(Continued from page 149)

is a small Jeffrey vibrating feeder that delivers material to bags that rest on a small pair of dial scales. After each sack has been filled to the desired weight, the operator places it in the sewing machine where the bag is closed. This section is not a part of the automatically controlled plant. It is a one-man unit-packaging process, but average output is 1000 packages per shift. The illustration shows Dry Mix grout being packaged on this machine.

The know-how of this business is not so much related to processing and plant layout. Rather, success of the venture lies in the ability to market, sell and distribute in sufficient volume to keep the producing plant busy. Apparently, the process of marketing small units to distributors, hardware stores, nurseries, etc. is not one that breeds success overnight. Dry Mix Products Co. has been plugging away at the project for several years, with their products now being distributed throughout the 10 western states and Hawaiian Islands. Under the general management of Boyd E. Oliver, company president, and L. R. (Bob) Jefford, sales manager, the business now experiences outstanding success. Geo. B. Magie Jr. is general production manager and A. L. Stogdill is plant superintendent.

SAVINGS ON CRANE RENTAL PAY FOR GERLINGER *in less than One Year!*

One-Man Operation of JOB-PROVED Fork Lift Truck Cuts Payroll by TWO for CONCRETE PIPE CO. OF OHIO, INC.

The Concrete Pipe Company of Ohio, Inc., for a number of years was forced to rent a portable crane to handle large, heavy, cumbersome pipe at its North Randall, Ohio, plant. Operating and servicing crane required three men full time.

When the versatility of a Gerlinger fork lift truck was demonstrated... when it was shown that it not only could do the work of the rented crane, but also could transport pipe in the yard *and* in the drying kilns, as well as load trucks... *all a ONE-man operation*... the economies of Gerlinger mechanical handling were soundly proved!

Since then, Concrete Pipe of Ohio has acquired a fleet of three Gerlinger fork lift trucks which are kept profitably busy at both the main plant and the Erie, Pennsylvania, plant.

Versatile Gerlinger proves invaluable to Concrete Pipe of Ohio for yard, kiln, trogsporting jobs.

Gerlinger Powerhouse makes light work of heavy, cumbersome pipe, replacing costly, limited-in-use crane in two plants.

"S" SERIES FORK LIFT TRUCKS
5 short wheelbase (106") models.
4 to 8-ton capacity.
Lifting heights from 10' up to 18'.

"L" SERIES FORK LIFT TRUCKS
6 long wheelbase (130") models.
6 to 11-ton capacity.
Lifting heights from 10' up to 24'.

G-415

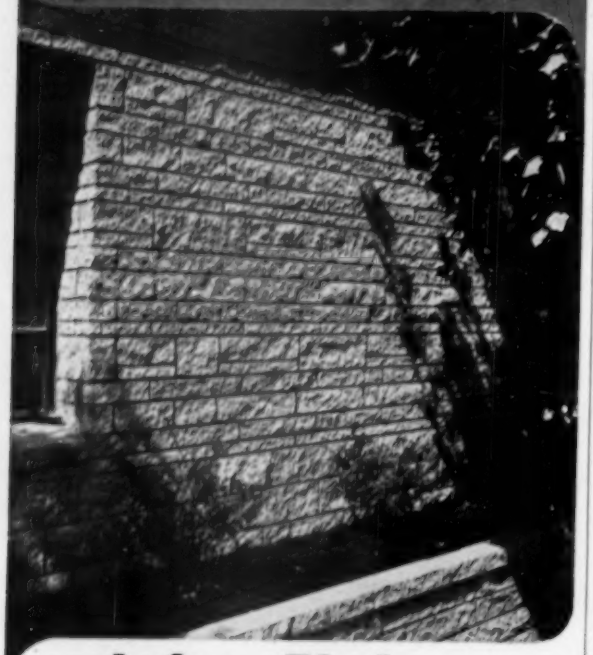
GERLINGER PRODUCTS

SEND TODAY FOR NEW GERLINGER FORK LIFT TRUCK CATALOG...

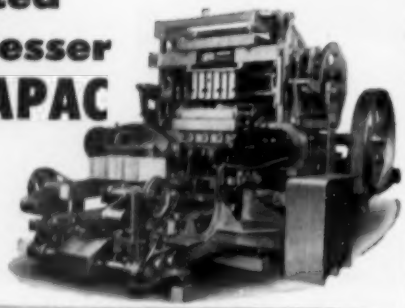
Gerlinger Fork Lift Trucks consistently outperform other material handlers in the concrete field. Gerlinger's exclusive counter-active weight distribution eliminates the common problem of varying load widths and weights of pipe, brick, tile and concrete block. Gerlinger equipment can save time, money and manhours for your firm, too. No obligation.

GERLINGER CARRIER CO. • DALLAS, OREGON

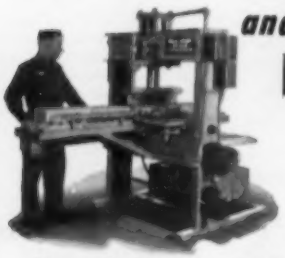
Give Customers Beautiful Split Block Like This—



made from Block produced on a Besser VIBRAPAC



and Split on a BES-STONE Block Splitter



Yes—split block *is* beautiful if it's made *right*, using a Besser Vibrapac and Bes-Stone Splitter—the combination that gives you NEW PROFIT OPPORTUNITIES plus SATISFIED CUSTOMERS. Get all the facts from your nearby Besser Representative, or write for literature to:

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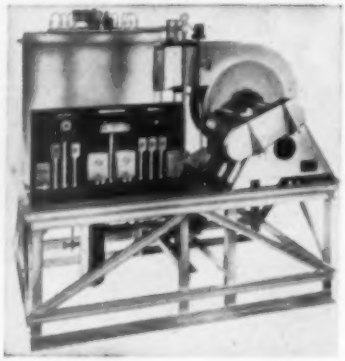
Complete Equipment for Concrete Block Plants
ALPENA, MICHIGAN, U.S.A.

"For Autoclave Competition"



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Gives you a STRESS-FREE block with MAXIMUM VOLUMETRIC STABILITY.

Installation and operating costs are only a fraction of that involved in an autoclave.

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- OFF SIDES AND REAR
- INTO BASEMENTS
- OTHER TRUCKS

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NOW AVAILABLE FOR TRAILERS

PARTIAL LIST OF SATISFIED USERS:

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- The Plasticrete Corp., New Haven, (2 units)

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- Meekins, Inc., Hollywood (2 units)
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- Maule Industries, Inc., Miami (2 units)

ILLINOIS
- The Michigan Silo Co., Peoria (2 units)
- Peoria Concrete Construction Co., Peoria

INDIANA
- South Hammond Concrete Products Co., Hammond
- M. L. Dague Co., Muncie

IOWA
- Marquart Concrete Block Co., Waterloo
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- Carl Krebs, Fort Thomas

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- Bostone Incorporated, Chardon
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MODEL P-7A 7,000 lbs.
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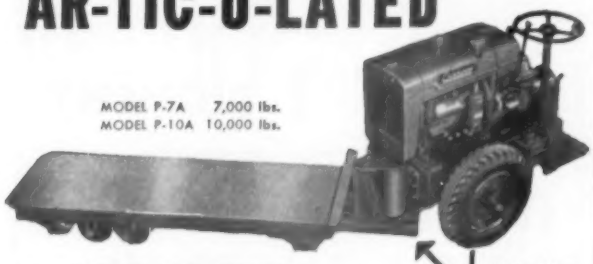

United by a joint

IT TURNS IN THE MIDDLE— TAKES THE CORNERS LIKE A BREEZE

Write for literature

Erickson has created a revolutionary new idea in platform trucks—it's ARTICULATED—with a joint or pivot between platform and drive wheels. Models P-7A and P-10A are the units for the new and unusual operations,—autoclaves, for instance—where you need utmost maneuverability with heavy duty capacity. With the ARTICULATED design, platform bed can be made up to 10 or 12 feet and still handle heavy, bulky loads with ease. These articulated models are in addition to the veteran Erickson P-5 and P-7 standard models, and built with the same rugged durability.

the WORKHORSE of LIFT TRUCKS

Erickson

POWER LIFT TRUCKS, Inc.

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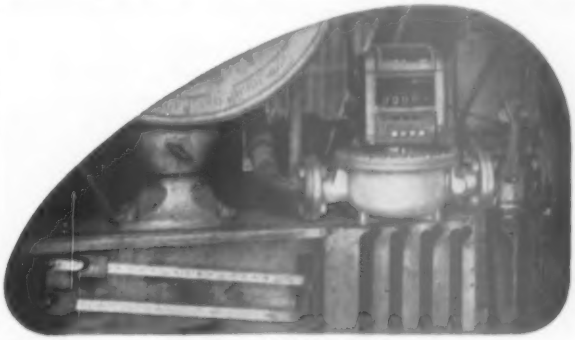

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Most important problem in ready-mix concrete is control of *water* . . . and the simplest, surest control is this Auto-Stop water meter. Just push buttons to set pounds or gallons required, open the valve, and the meter shuts off automatically. Speeds loading, and improves block machine performance. Easy to read, saves space, and reduces structural requirements. Round dial non-Auto-Stop also available. Write today for full details . . .

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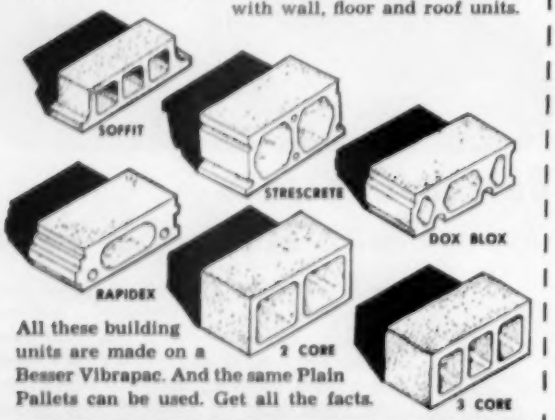
Block for FLOORS

Block for ROOFS

Fire-safe walls? Of course! But floors and roofs should be fire-safe, too. Walls are full of openings (windows, doors, etc.), while floors and roofs are relatively solid. Actually, TWICE the volume of block is required for floors and roofs than is required for walls. So why not go after this profitable market? Supply customers with wall, floor and roof units.



All these building units are made on a Besser Vibrapac. And the same Plain Pallets can be used. Get all the facts.

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BESSER COMPANY

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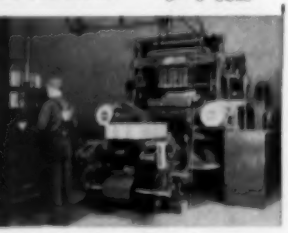
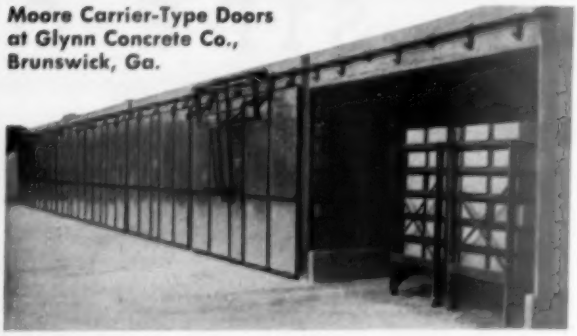
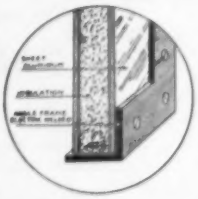


Moore Carrier-Type Doors at Glynn Concrete Co., Brunswick, Ga.



Moore Metal-Insulated Kiln Doors Save Fuel—Reduce Curing Time



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1 PIGMENT

for CONCRETE PRODUCTS

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SHADE	PIGMENT	LBS. PER BAG OF CEMENT
Buff	No. 161	½ lb.
Suntan	No. 161	¾ lb.
Coral	No. 161	1 lb.
Salmon	No. 161	1½ lbs.
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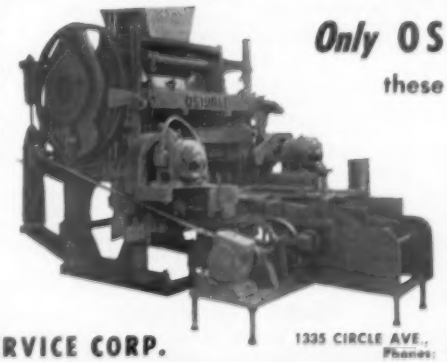

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Block Machinery

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Specialists in Concrete Products Equipment
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2—Stearns Clipper Strippers .. 250.00 each
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2—Air Offbearers Stearns #7 & 9 ..... 250.00 each
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100,000 pressed steel pallets in stock
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SPLASH-BLOCKS LAWN TRIM
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2,000 Wood Pallets 18" x 20".
These are all too good to sell for junk. Make us an Offer.

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*Specify type.

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___Batchers
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___Bin Level Indicators
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___Bits*
___Blasting Supplies
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___Bodies, Trailer*
___Brick Machines and Molds
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___Wire Rope

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MIX-MIZER

$395.00

Fully Guaranteed

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INDEX TO ADVERTISERS IN THE CONCRETE PRODUCTS SECTION OF ROCK PRODUCTS

SEE INDEX OF ROCK PRODUCTS SECTION ADVERTISERS ON PAGES 191, 192

Adrian Peerless, Inc. 170

Barber Greene Company 163
Berg Vault Co. 173
Bergen Machine & Tool Co. 140
Besser Company 155, 158, 168, 176, 178
Blaw-Knox Co. 165
Blue Ridge Talc Co., Inc. 181
Butler Bin Company 162

Campion-Detroit Company 176
Cedar Rapids Block Co. 173
Clipper Manufacturing Co. 176
Columbia Concrete Products Co. 180
Columbia Machine Works 166, 167, 180
Concrete Transport Mixer Co. 169
Craine, Inc. 180

Davis, Frank D., Company 178
Dur-O-waL Products, Inc. 173

Edick Laboratories 179
Elberfeld Manufacturing Co., Inc. 179
Erickson Power Lift Trucks, Inc. 177

Food Machinery and Chemical Corp. 142

G. & H. Machine Co. 172
General Engines Co., Inc. 181
George, F. C., Machine Co., Inc. 152
Gerlach Builders Supply, Inc. 180
Gerlinger Carrier Co. 175
Gerson Company 180
Glenstone Block Co. 181

Handi-Crete, Inc. 173
Haverstick Bros. 164

Jaeger-Lambo Machine Corp. 180
Johnson, C. S., Co. 160, 161

K & R Air Powered Equipment Co. 179
Kent Machine Co. 174
Kirk & Blum Mfg. Co. 172
Koehring Co. 160, 161

L & L Fuelling 180
Lackey, W. H., Inc. 182
Landers-Segal Color Co. 181
Landreth Redi-Mix 180
Lay-Rite Concrete Products Co. 180
Lehigh Portland Cement Co. 141

Mack Trucks, Inc. 171
Memphis Equipment Co. 156
Moore Dry Kiln Co. 178

Nassau Concrete Products Co., Inc. 180
Neptune Meter Co. 177
Nieb Concrete Products Co. 181

Oswalt Engineering Service Corp. 179

Park Mold & Step Co. 180
Penn-Dixie Cement Corp. 157
Pennsylvania Industrial Chemical Corp. 183

Quinn Wire & Iron Works 156

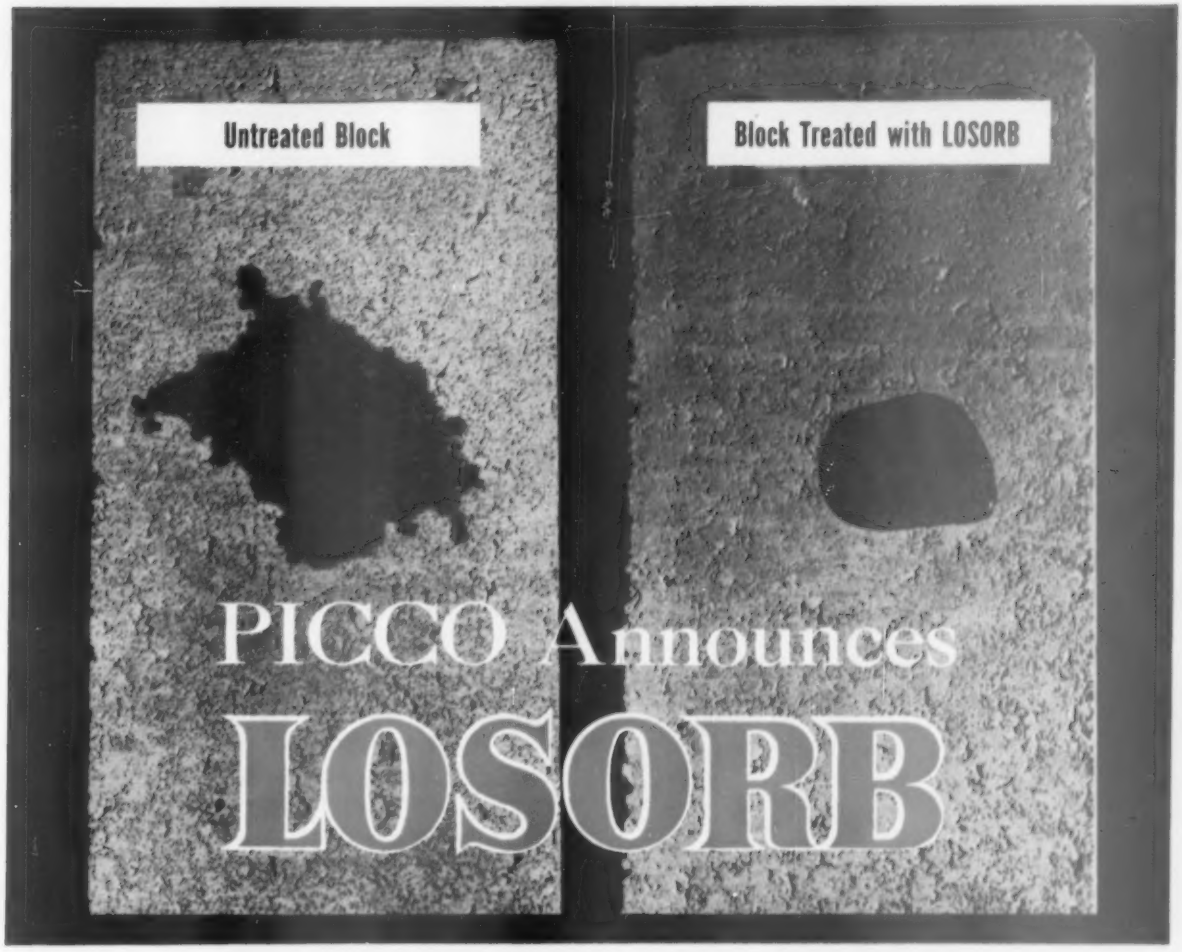
Richardson Scale Co. 156
Rinkin, C., & Olson, H. 159

Side-O-Matic Unloader Corp. 177
Smith Chemical & Color Co. 180
Southeast Ready-Mix 184
Spillman Mfg. Co. 181

Texas Foundries 180

United Builders 180
United States Steel Corp. 138
Universal Atlas Cement Co. 138

Walton Steel Co. 180
Williams, C. K., & Co. 162
Wittemann Machinery Co. 180



MOISTURE-PROOFING ADDITIVE

for concrete and cement materials

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In addition, Losorb makes the mix more plastic, homogeneous and easy to work, acts as a lubricant in the moulding operations, and minimizes cracks.

Losorb is easy to use—simply add a small percentage (2% to 4%) to the mix. No other change in processing is necessary to give your blocks the decided advantage of *waterproof!*

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Clairton, Pennsylvania

Plants at:
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Sales Offices
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Position_____
Company_____
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Moving Day

is no problem with

TRAVEL BATCHER

TRADEMARK

The hopper can be recharged with either a dump truck or a front-end loader, and can be used with 3-, 4-, or 5-yard mixers.

MOVING DAY is no problem with the new on the job TRAVEL BATCHER. Instant maneuverability makes the TRAVEL BATCHER available for several jobs a day, and its speed of operation results in the production of up to 100 yards per hour.

Batch mixture is maintained uniformly with accurate scales mounted on the machine. By bringing the batch plant closer to the job, it reduces the number of truck mixers needed by as much as 83%.

The TRAVEL BATCHER offers the performance of a stationary batch plant, plus the convenience of mobility.

TRAVEL BATCHERS are being used by the largest contractors on Bureau of Reclamation projects, Army Air Force, Navy and Marine installations, Atomic Energy projects, Defence Projects in Alaska, Royal Canadian Air Force Stations in Canada, and on many government and state highway projects.

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Cancer and healthy cells seem to feed on different kinds of "food." We know how to make some cancer cells die by starving them. Will we starve out all kinds of cancer cells one day? Only more work and research will tell.

Some cancer patients develop substances that fight their own tumors. When science knows more about antibodies, we may have a new cancer treatment. Only more work and research will tell.

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New drugs are being developed that fight specific kinds of cancer. Will any of them turn out to be cancer-killers? Only more work and research will tell.

Some good news about cancer

. . . and how you can make the news better

These photographs illustrate some of the work our scientists are doing in the fight against cancer. Just one thing is needed to keep this research going. Your help. If you—and all of us—give today, the research will go on until we conquer our greatest enemy—cancer. Help fight cancer with your check. Give generously Send your contribution to CANCER, c/o your town's Postmaster. AMERICAN CANCER SOCIETY.

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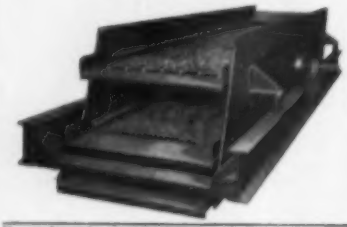
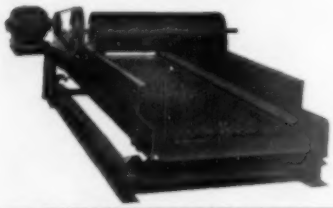
NEW BONDED® HEAVY DUTY VIBRATING SCREENS



Model Number	Screening Area	No. of Decks	Sale Price
124AS	2' x 4'	1	$ 443
224AS	2' x 4'	2	472
126AS	2' x 6'	1	472
226AS	2' x 6'	2	501
136AS	3' x 6'	1	581
236AS	3' x 6'	2	688
336AS	3' x 6'	3	956
138AS	3' x 8'	1	675
238AS	3' x 8'	2	815
338AS	3' x 8'	3	996
188BS	3' x 8'	1	1231
288BS	3' x 8'	2	1282
388BS	3' x 8'	3	1375
248BS	4' x 8'	2	1865
348BS	4' x 8'	3	2035
2410BS	4' x 10'	2	1953
3410BS	4' x 10'	3	2305
3412BS	4' x 12'	3	2635

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry. HEAVY DUTY MODELS, TYPE BS: 4-bearing positive throw, eccentric shaft; 3' x 8' to 5' x 14', 1 to 5 decks. GENERAL DUTY SCREENS, TYPE AS: eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for new 8-page Bulletins 1086 and 1087.

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1397	$ 722
14"	50'	2222	1144
14"	85'	3377	1733
16"	20'	1262	636
16"	45'	2137	1088
16"	60'	2662	1359
16"	90'	3712	1900
18"	25'	1477	794
18"	45'	2217	1166
18"	70'	3142	1648
18"	85'	3697	1933
18"	100'	4252	2220
18"	130'	5362	2797
20"	25'	1517	828
20"	60'	2882	1533
20"	75'	3467	1838
20"	90'	4052	2145
24"	25'	1590	898
24"	45'	2430	1330
24"	70'	3480	1875
24"	100'	4740	2514
24"	120'	5580	2950
24"	150'	6840	3603
30"	50'	2911	1617
30"	70'	3871	2119
30"	90'	4831	2614
36"	25'	1818	1118
36"	45'	2858	1678
36"	60'	3638	2096
36"	100'	5718	3214

If you need a conveyor longer or shorter than any of those listed above, you can find the cost by adding or deducting the following per foot prices, according to belt width, for each foot of completed conveyor, including belting as described above.

For 14" belt	$16.84 per foot
For 16" belt	18.04 per foot
For 18" belt	19.24 per foot
For 20" belt	20.37 per foot
For 24" belt	21.78 per foot
For 30" belt	24.75 per foot
For 36" belt	27.95 per foot

NEW CONVEYOR BELTING

Save Up To 25%

Heavy duty 4-ply, 28 oz. duck, ⅛" top rubber cover by 1/32" bottom cover, 12# to 15# average friction pull, 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.

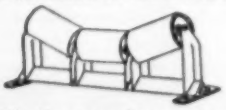
Width	List Price	Sale Price
14"	$3.43 foot	$2.75 foot
16"	3.86 foot	2.88 foot
18"	4.27 foot	3.19 foot
20"	4.69 foot	3.69 foot
24"	5.55 foot	4.14 foot
30"	6.77 foot	5.06 foot
36"	8.01 foot	6.00 foot

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover, 16# to 19# average friction pull, 2500# to 3000# average cover tensile belting, or 24# to 33# average friction pull, 1960# to 2300# average cover tensile belting. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price	Sale Price
16"	4	$4.59 foot	$3.36 foot
18"	4	5.09 foot	3.72 foot
20"	4	5.57 foot	4.24 foot
24"	4	6.56 foot	4.80 foot
30"	4	8.05 foot	5.89 foot
24"	5	7.68 foot	5.61 foot

Additional widths and plies available at low prices. Write for Free Sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$ 7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable pre-lubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible.

BONDED CONVEYOR ACCESSORIES

All Bonded Troughing Idler Conveyors (described in this ad) can be equipped with any accessory described below or use them on your present conveyor or bucket elevator. Write for Bull. #1138.

Carry Belt Guide Idler $14.50

Return Belt Guide Idler $11.75

Wing Pulley $71.50

Holdback $99.00

Self-Aligning Idler $60.75

Head & Tail $149.00

Roll Idler $7.25

YOU ARE WELCOME TO VISIT THE BONDED FACTORY ANY TIME

BONDED SCALE AND MACHINE COMPANY

WRITE FOR FREE CATALOG AND PRICES

PHONE: Hickory 4-2186 Days; PHONE: AXminster 1-2213 Evenings

128 BELLVIEW — COLUMBUS 7, OHIO

Mfgrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders

ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT WHERE TO BUY ADVERTISING IN CONCRETE PRODUCTS SECTION

KILNS—DRYERS—COOLERS

1—8' x 125', 3/8" shell.
4—7' x 110', 9/16" shell.
1—7'6" x 7' x 125', 1/2" shell.
2—6' x 74', 3/8" shell.
2—7'5"x20', 5'2"x20' Link Belt, Rote-Louvre.
1—6' x 40', 3/8" shell.
1—6' x 60', 5/16" shell.
1—4'6" x 50', 3/8" shell.

CRUSHERS—PULVERIZERS—MILLS

2—Allis Chalmers 10" Superior McCully.
1—Allis Chalmers k-9 Gates Gyratory.
10—Jaw Crushers 5"x6" to 42"x48".
2—Pennsylvania #5XR-100, 100 TPH.
3—Hardinge 4½' x 16", 6' x 22", 7' x 36" Ball Mills.
3—Patterson 6'x8' Ball Mills.
1—Raymond #53 Imp. Mill.
1—Dixie #2424 non-clog Hammermill.
7—NEW Jeffrey Hammermills 24"x20", 20"x 12", 8" x 15".

SCREENS—SEPARATORS

3—Tyler Hummer Screens 4'x7', 4'x8', 3'x10', single and double deck.
1—Link Belt 3'x8' double deck screen.
5—Rotex 40"x84", 40"x120".
1—Air Separator 4'.

MISCELLANEOUS

2—Chicago 14"x7" Compressors, 434 sfm.
2—Oliver Rotary Dewaterers 8'x4'.
12—Bucket Elevators 20' to 75' centers.
250 ft. Link Belt 12" Troughing Conveyor.
1—10,500 gpm Centrifugal Pump 135' head.

Partial List

Your Inquiries Solicited

BRILL EQUIPMENT COMPANY

2401 Third Ave. New York 51, N.Y.

or

4101 San Jacinto St. Houston 4, Texas

THREE LIQUIDATIONS

2—Raymond 5 roll high side mills, motor driven, complete.

1—7' x 48" Hardinge ball mill.

1—Patterson 8 x 10' line ball mill, 100 HP.

3—Shutz O'Neill style D 28" limited mill.

6—Sutton & Steele air tables model VXM-100, 3 nes.

4—Rotex 20 x 48"—40 x 84" and 4 x 7' screens.

1—American Road jaw crusher model EF-20, 20 HP.

3—Roll crushers 20 x 10"—20 x 14"—30 x 14".

2—Tyler 4 x 5'—1 and 2 deck screens.

CHEMICAL & PROCESS MACHINERY CORP.

52 Ninth St. Brooklyn 15, N.Y.

QUARRY EQUIPMENT

Cedarapids 4033 hammermill secondary unit. Rebuilt.
Cedarapids model BBB 1036 jaw crusher scalping unit. Reconditioned.
Cedarapids 4033 hammermill. Rebuilt.
Cedarapids 3033 hammermill. Rebuilt.
Cedarapids 2033 hammermill. Excellent.
Cedarapids 42" x 10' apron feeder.
Williams 20" pulverizer.
McLanahan 12" x 30' log washer with V-belt drive.
12" x 25' inclined open elevator. New.
Heltzel 40' x 12" 75 ton per hour enclosed elevator.
27½ ton single compartment 8'x12' bin.
60-ton, 2-comp., 8' x 18' storage bin w/clam gates.
100-ton, 2 comp., 13'x23' bins.
Special bins to your specifications.
Conveyors—18"-24"-30"-36". Also belting.
18" dia. x 20" face magnetic pulley.

SHOVELS AND CRANES

Osgood Model 902 2 yd. diesel or crane.
Lima 34 Paymaster ¾ yd. diesel. Very good.
Brownhoist 1-yd. gas shovel-crane.
Lorain Byers 63 diesel backhoe.
Lorain MC-414 20-ton truck crane. Excellent.
Lorain TL-20 4x4 self-propelled. Reconditioned.
Lorain TL-30 6x4 15-ton truck crane. Reconditioned.
Lorain TL-25-S ¾ yd. diesel, wide gauge crawler.
Insley Model K12, ½ yd. crawler clam-crane. Good condition.
Unit 1014, 6x4 motocrane.
Michigan C16, ½ yd. crawler shovel.

TRACTORS, TRUCKS, SCRAPERS, ETC.

3—Euclid rear dumps, 22 ton. Good condition.
2—Cat DW15 scrapers. Excellent condition.
3—Cat DW10 scrapers. Good condition.
1—Allis-Chalmers HD10 with Baker bulldozer.
1—Int. TD18 with Bucyrus-Erie bulldozer blade.
1—Woolridge 15-18 yd. Model TCR scraper. Rebuilt.

DIESEL POWER UNITS

Caterpillar D7700, 63 H.P. @ 1000 RPM. Rebuilt.
Caterpillar D13000 6-cyl. diesel engine. Twin Disc clutch, extended shaft, outboard bearing. 145 H.P. @ 1000 RPM. Rebuilt.
Caterpillar D17000 8-cyl. diesel complete with radiator and clutch.

ASPHALT PLANT

Barber-Greene model 848 with drier, graduation unit, etc.

AIR COMPRESSORS

600 cu. ft. Gardner-Denver diesel, practically new.
500 cu. ft. Gardner-Denver diesel, rebuilt.
500 cu. ft. Ingersoll-Rand Waukesha. Reconditioned.

L. B. SMITH, INC.

CAMP HILL, PA.

Phone Harrisburg REgent 7-3431

New Liquidations

Contact us for Descriptions

Machinery Center, Inc.—Offers

CONVEYORS
1—36" Belt x 594' Steel frame, excellent.
1—36" Belt x 523' Steel frame, excellent.

CRUSHERS
1—10 x 20 Pacific Jaw, Like New
1—10 x 24 Denver
1—36" x 48" Traylor Jaw, Type R
1—5½' Symons Shorthead Cone

BALL MILLS
1—8' x 6' Marcy, Complete
3—8' x 48" Hardinge Conical
1—8' x 36" Hardinge Conical
1—5' x 8' Joshua Hendy
1—5' x 5' Allis Chalmers
1—6' x 8' Allis Chalmers
1—5' x 4' Marcy, Like New
1—6' x 4½' Marcy

ROD MILLS
1—9'6" x 12' Marcy, w/450 HP Motor
1—5' x 10' Stearns-Roger, Complete

SCREENS
1—5' x 10' Tyler Ty-Rock, 2-deck
1—2' x 6' Denver Dillon, double deck

PLUS THOUSANDS OF ADDITIONAL ITEMS
WRITE, PHONE, OR WIRE YOUR INQUIRIES

MACHINERY CENTER, INC.

P.O. BOX 964, SALT LAKE CITY, UTAH

PHONE HUnter 4-7601

SHOVELS—CRANES—DRAGLINES

Northwest 6, 1½ yd., dragline crane, 95' boom.
B-E 22B ⅝ yd. Shovel-Crane-Backhoe-Drag.
Northwest 80-D Diesel Shovel 2½ yd. New 1952.
Lorain L-820 2-yd. Shovel-Drag-Crane 100' bm.
Buc-Erie 54-B Diesel Shovel, 2½ yd.
Lorain 802 Crane-Drag, 90'bm. Diesel Swamp Cats.
Lorain Model MC 25-W truck-crane 25 tons cap.
Bay City 190T61 truck crane 25 tons. Diesel.
Link-Belt HC90 truck crane 25 tons 90' alloy boom.
PAH 225A truck crane 20 tons cap. 90' boom.

LOADERS

Hough Model HM 1½ yd. Pay Loader.
Hough Model HMD 1½ yd. Diesel.
Euclid Model 10YB Cummins Diesel.
Hough T10 1 yd. bucket (Diesel).

CRUSHERS—KILNS—DRYERS

JAW: Acme 10x20, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40, Eagle 20x36, Diamond 24x36", Cedar Rapids 10x20, 20x36, 25x40, Farrell 10x20, 18x30, 14x36, 18x36, 36x48, Buchanan 36x42. Aus-West 90x40, Traylor 14x36, 24x36. Allis-Chalmers 30x18, Good Roads 10x30, Telsmith 18x32, Traylor 48x60, 42x48, Allis-Chalmers 42x40.
GYRATORY: Al-Chal 22, 6, 7½, 8, 9, 9K, 10, 20 and 30 Telsmith 8B, 28" Intrecone, Kennedy Van Saun 7, 19, 23½-S, 37½, 38, Traylor TY 1'8", 4' Type TS.
ROLL: Cedar Rapids 40x20, Pioneer 40x22, Pioneer 20x18, Telsmith 24x16, Universal 40x24 double.
HAMMERMILL: Jeffrey Type H3 24x20, Type B 36x24, 36x36, 36x42, Eagle 24x24, Stedman 24x30, 42x30, Raymond 50-56, 30x42.
BALL MILL: K.V.S. Type M 6'x8' Airswept, Marcy No. 64½', Hardinge conical 10'x48", 10'x36", 6'x22", 6'x12', 5'x7', A-C 8'x16'.
TUBE MILLS: 5'x16', 5'x20', 5'x22', 6'x12'.
ROD MILL: Jackson & Church 4'x10' 10 ton rods, new. Marcy 5x8, 5x12, 6x12, Ruth 4'x11'.
AUTOCLAVES: Jackson & Church, bolted head 50'x6' "Quick Acting" head 50'x6'6".
CONE: Symons 3' and 5' coarse bowl.
KILNS: 4'x42', 5'x30', 6'x50'6", 6'8'x45', 7'x110', 10'6"x105', 8'x10', 7'6"x7'x125'.
DRYERS: Louisville 6'x30', 6'x50', others 4'6"x40', 7'x80', 10'x100', 6'x20' complete with motor. NEW.
COMPEB MILLS: A-C 7'x24' with motor drive.

CRUSHING PLANTS

Cedar Rapids 2036 Primary 75 HP GM Diesel.
Pioneer 150 Primary 2036 Cat D8800 Diesel.
Pioneer Secondary 4022 roll Cat. D 13000.
Cedar Rapids Pitmaster Portable.
Pioneer 305W, crushing, washing, screening.
Cedar Rapids 40x33 Port. Secondary, Diesel.
Aus-West 2540 Port Primary.
Pioneer Port. 11x36 jaw, 40x20 rolls.
Diamond 66, Port. Prim. 1036, Secondary 3018.

CLASSIFIERS

Concrete 4'x10' sand-dewatering pump and motor.
Dorr 5'x20' Rake type.
Dorr 6'x27' Duplex. Rake type.
Hardinge 8'x14', countercurrent, scrubber.
Telsmith Twin Screw Rewasher 18"x11'3".
Dorr Type DSFH 29' dia. bowl.

CONCRETE PLANTS AND EQUIPMENT

Noble CA-245, complete plant, almost new.
Noble CA-155 5 compt., 150 ton bin.
Erie Strayer port. 25 yds. per hr.
Mixermobile 2 yd. 45' tower. Extension to 155'.
C. S. Johnson 492 bbl. bulk cement plant.
Cement silos. Corps of Engr. Spec.
Johnson concrete plant 300 yds. Corps Engr. Spec.
5 aggr. compts. cement silo 9700 bbls.
R-K 600 bbl. cement bin. 600 bbl. silo.
Noble Model CA-154 Concrete Plant.

SAND AND GRAVEL HYDRAULIC DREDGES

Morris 16" x 14". Portable. Electric.
10" Portable Diesel powered. Complete.
12" Diesel powered, pontoon mounted. Complete.
Ellicott 8" with cutter. Diesel Hull 48'x18'x2'6".
8" Hydraulic Diesel. On 32'x8' steel pontoons.
Ameco 10" Diesel power portable. Excellent.
6" portable Diesel complete with cutters, etc.
8" H-P twin Diesel drive. Complete.

DERRICKS

American 30 ton Guy Derrick 100' boom, 116' mast.
Special 35 ton stiff leg derrick, 100' boom.
Nat'l Bridge 30 ton Guy Derrick, 100'.
American 30 ton stiff leg, 100' boom.

SCREENS

Tyler F-360 4'x12' 2 deck w/spray bars.
Simplicity 3'x8' 3 deck.
Acme 5'x21' revolv. scalping with motor.
Acme 5'x24' revolv. grading with motor.
New Holland 4'x10' 4 deck.
Diamond Model D1W3 3 deck 4'x12'.
Tyler 4'x10' two deck heavy duty, motor, Gen. Set.
Telsmith 5'x12' dbl. deck elec. motor.
C. R. 4' x 12' dbl. deck Elec. motor.

RICHARD P. WALSH CO.

30 Church St. New York, N. Y.
Cortland 7-0723 Cable: RICHWALSH

NEW 25 NORTHWEST BACKHOE

Never Used

Price—$22,000

38-B BUCYRUS ERIE

Shovel or Crane

1½ Yd.—Used 3,640 Hrs.

Price—$42,000

Frank Swabb Equipment Co., Inc.

313 Hazleton Nat'l. Bank Bldg.

Hazleton, Pa. GLadstone 5-3658

OVERHEAD ELECTRIC TRAVELING CRANES: 5 to 50 tons capacity, 20 ft. to 95 ft. span, A.C. and D.C.

DORR CLASSIFIER AND WASHER: 12'x30'x 2½', quardruplex wood tank, with 20 H.P. motor. Condition excellent.

DORR TROMMEL: 5' to 6' dia., 16'6" long, with motor.

FLOTATION EQUIPMENT complete including pulp sampler and distributor, mineral jigs, 6 cell flotation machines, super charger, agitator, 4" concentrate pumps, reagent distributors, etc. Used only 300 hours.

FEEDER: Robins heavy duty manganese steel, Ore Rock Feeder 60" x 14 ft. with 20 H.P. motor, reducer, etc. New condition.

PAN CONVEYOR: 48" x 110 ft. complete with motor, reducer, etc., heavy duty type, designed for rock.

BALL MILLS: 9'6" x 11', NEW. Two Allis Chalmers 5' x 22' Tube Mills with steel heads.

ROD MILLS: 2—Marcy Open End size 5' x 14'.

DRYERS: 2—Heavy duty 9' x 70' with all equipment, new condition.

JAW CRUSHERS: 10 x 20, 18 x 30, 18 x 36, 24 x 36, 30 x 42, 42 x 46, 48 x 60, with or without motors.

LOCOMOTIVE CRANE: 20 ton capacity, standard gauge, gasoline powered, cast steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.

MINE HOISTS: Single and double drum 100 to 1500 H.P., with all electrical equipment. Complete specifications, drawings, photos available.

MOTORS: 1—700 H.P. and one 450 H.P. synchro motors, 180 RPM, 2200/4160 volts, with controls. NEW, UNUSED. One G.E. 50 H.P., 2200 volts, 3 phase, 60 cycle, 450 RPM, with control equipment.

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA

A. J. O'NEILL

Lansdowne, Pa.

Phila. Phone: MAdison 3-8300—3-8301

TEN TRANSIT MIXERS

We have 10 Transit Mixers, all truck-mounted except 2—all located in our Rockford yard. No place can you find such a wide selection in one place.

6—Jaeger 3 yd. (4¼ yd. Agitator) Hi-Discharge, 1945-1951 Models, mounted on 6-wheelers, ranging from $1500. up.
2—Smith 3 yd. (4¼ yd. Agitator) Hi-Discharge, mounted 6 wheeler @$1500., unmounted @ $900.
1—Rex 3 yd. (4¼ yd. Agitator) Hi-Discharge, unmounted @ $1250.
1—Rex 2 yd. (3 yd. Agitator) Hi-Discharge, mounted Dodge single axle truck @ $600.

NOTE: Buy used ones now while cement is short—trade them later for new ones. Terms to all.

SHOVELS & CRANES

Link-Belt Speeder	"LS-85" H.D. ⅝ yd. Diesel Shovel Reconditioned.
Unit	"514" ½ yd. Used Trench Hoe.
Lorain	"TL-20" ½ yd. Used Dragline or Trench Hoe.
Unit	Shovel Attachment for Unit "514".

MISCELLANEOUS

Caterpillar	"D-6" Diesel Tractor w/ Hi-Lift Cable Traxcavator, 1950 model in fine shape @ $6850.
Caterpillar	"D-6" Diesel Tractor w/ Traxcavator. Needs some track repairs, @ $4500.
Adams	"411" Diesel Motor Grader, w/Cab & Scarifier @ $2200.
Barber-Greene	"705" RT Runabout Ditcher, serial number 705-49-4. Digs 4½ ft. deep.
Universal	"880 Jr." Portable Gravel Plant, 1024 RB Jaw, 2416 RB Rolls, 4x12 2½-Deck Screen, Cat. D-8800 Diesel Power. Pneumatics.

EIGHMY EQUIPMENT COMPANY

120 S. Pierpont, Phone 4-6706, Rockford, Ill.

Link-Belt 8" Encl. Spaced Elevator 58' centers, with platform.
Barber-Greene 12" Bucket Loader.
4—Easton Dump Cars 24" ga. 1½ yd.
Dings Crockett Magnetic Separator.
Acme Road Mach. Jaw Crusher 10x18.
Acme Jaw Crusher 14" x 26".
Climax Jaw Crusher 10" x 20".
Dodge Lever Type Jaw Crusher 9x15.
American #135A Hammermill.
Kennedy #195 Gearless Gyratory.
5—5' and 6' Pebble Mills.
Abbe Turbo-Sifter #2 Blutergess.
Cedar Rapids D.D. Screen 3x10'.
Hummer Type 31 D.D. Screen 6x5.
National 25 HP D.D. Dragline Hoist.
Lambert 2 Drum Derrick Hoist 50 HP.
Lidgerwood 1 Drum 30 H.P. Dock Winch.
Stroudsberg 1 Drum Hoist Size 500.
Sullivan 1 Drum Electric Tugger Hoist.
15 Ton Stiffleg, 110' Boom.
42" x 12' Air Tank ½" shell.
40" x 21' Dryer, hoods, burner.
36" x 25' Dryer, parts only.
10" and 12" Gravity Roller Conveyor.
Apron Feeder 18" x 5½'.
Jeffrey Apron Feeder 30" x 33'.
5—Rotary Feeder Valves.
Simplex & Duplex Bin Gates.
V-Belt Sheaves, approx. 250.
18" and 24" New Idlers.
69—36" Trough Idlers 5 roll type.
58—30" Trough Idlers misc. types.
46—42" Trough Idlers, antifriction.
135—48" Trough Idlers, antifriction.
Misc. Sizes Large Conveyor Pulleys.

G. A. UNVERZAGT & SONS INC.

136 Colt St. Irvington 11, N.J.

SPECIALS

2—New 6½' x 150' Kilns.
1—Complete Lime Hydrating Plant.
1—6 Williams Jumbo hammermill.
1—28" Telsmith Intereone Crusher.
2—#330 Allis-Chalmers hydrocone crushers.

KILNS

1—4½' x 40', 8' x 125'.

DRYERS

1—4½'x30', 8'x125'.

CRUSHERS

1—48" x 42", 18" x 36", 12" x 24" Jaw Crushers.
2—42" x 16" Allis-Chalmers Crushing Rolls.
36" x 16 rebuilt Sturtevant rolls.
2—24" x 14" Rogers Iron Works Crushing Rolls, Rebuilt.
1—24" x 12" Farrell Bacon Crushing Rolls.
1—6", 10", 16", 30" McCully Superior Gyratory Crushers.
No. 3 up to No. 12 Gyratory Crushers.

BALL, ROD & TUBE MILLS

1—6'x12', 5½'x10' Ball Mills.
1—5½'x10' Rod Mills.
2—5½'x20', 5'x22' & 6'x22' Tube Mills.
2—6'x22' Compeb Mills.

MISCELLANEOUS

1—14' Air Separator.
1—6'x4', 12'x10' Oliver Filters.

We make new dryers and kilns.

Have you any machinery that you want to sell?

W. P. HEINEKEN, INC.

50 Broad St., N. Y. Tel. Wh. 4-4236

ELEVATORS

50' c/c 8x5 buckets, complete.
32' c/c 6x4 buckets on 7" belt.
26' c/c 8x6 buckets, steel case.

PULVERIZERS—MILLS—CRUSHERS

4'x8' Kennedy Type M Ball Mill.
7'x36" Hardinge Conical.
6'x8' Patterson Ball Mill.
5'x10' Allis Chalmers Tube Mill.
8'x16' Patterson Ball, Buhrstone.
24"x20" Jeffrey Hammer Style B, NEW.
20"x12" Jeffrey Hammer Style A, NEW.
15"x8" Jeffrey Hammer Style B, NEW.
8"x15" Pacific Jaw Crusher.

KILNS—COOLERS—DRYERS

5'x20'x⅛" welded.
5' x 10-Hearth Furnace.
4'6" x 40' Rotary Dryer.
310-12 Link-Belt Roto Louvre.
502-20 Link-Belt Roto Louvre.
705-20 Link-Belt Roto Louvre, SS.

SCREENS

48" 3-deck SWECO Sifter.
Tyler 5 x 12, 3 x 10, Wet type.
Robinson Gyro Sifter 28A.
Gayco 5' & 18", all with motordrives.

MISCELLANEOUS

625 CFM Worth. Compressor 14x13.
8' x 10' Oliver Rotary Filter.
150 HP Union W.T. Boilers.
47' Conveyor 12" Screw, 2 HP motor.
36"x50" Bird Cont. Centrifuge.
40" Bird Centrifuge SS susp. perf.

HEAT & POWER CO., INC.

60 East 42nd St., New York 17, N.Y.

Murray Hill 7-5280

(Machinery & Equipment Merchants)

2400 LIMA DRAGLINES & SHOVELS

2400 Lima Dragline, 120' Boom 3—6 Yd. Buckets, Hamilton Diesel Engine

2400 Lima Dragline, 110' Boom 2—6 Yd. Buckets, Hamilton Diesel Engine

2400 Lima High Lift Shovel, 67' Boom, 50' Stick, 4 yd. Dipper, Cat D-397 Diesel Engine

Also, Standard 6 Yd. Shovel Front Attachment for 2400 Lima and 5½ Standard Shovel Front Attachment for 4500 Manitowoc

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Hazleton, Pa. GLadstone 5-3658

FOR SALE

PULVERIZERS Jeffrey 42 x 24, type B, and S-6 Penna. Hammermills

COLLECTORS Ducon, one wet and one dry filter.

CLASSIFIER Dorr 26' bowl with 5' x 30' rakes.

SCREEN Robins 4' x 6½' Dble Deck Gyrex.

G. & W. H. CORSON, INC.

Plymouth Meeting, Pa.

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60"x48" to 6"x3"

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"Farrel-Bacon" Jaw Crushers

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Available throughout the U.S. — Items you need may be available near you. Your inquiries would be appreciated.

Buildings	Derricks	Loaders	Pavers
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Barges	Ditchers	Mixers	Rail
Buckets	Dredges	Motors	Scales
Belting	Drills	Meters	Screens
Cableways	Engines	Mills	Stacklines
Cars	Excavators	Machine-tools	Shovels
Compres-sors	Feeders	Pulverizers	Tanks
Conveyors	Graders	Pipe	Tractors
Crushers	Generators	Pumps	Trailers
Dryers	Hoists		Etc., Etc.
	Kilns		

(I can sell your surplus equipment)

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45 ton General Electric Diesel Elec. Loco.
25 ton Ohio Diesel Loco. Crane 1947.
Christian 2D Hoist & Swinger, 138 HP Buda Diesel Engine. 15,000 # SLP.
2 100 HP Lucey Portable Horiz. Fire-Box Boilers. 200 lbs. Oil Fired. ASME.
25 ton American Steel Guy Derrick.
30 ton Steel Stiffleg Derrick 125' bm.
1½ yd. Northwest No. 6 Diesel Crane 1948.
1½ yd. Bucyrus-Erie 38-B Diesel Crane 1948.
5 yd. Manitowoc 4500 Shovel-Dragline.

Mississippi Valley Equipment Co.

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ROTARY DRYERS & KILNS: 4'6" x 40'; 4'6" x 32'; 3'6" x 25'; 3' x 24'.

ROTARY COOLERS: 104" x 30'; 104" x 70'.

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AL. CH. 6' x 16' BALL TUBE MILL—30 HP.

JAW CRUSHER: 8" x 10".

PENNA. RING ROLL GRANULATOR—Trojan K3-24.

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All 120' Booms, 5 Yd. Buckets

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1—Six Months Old

2—1954 Machines

1—1953 Machine

1—1951 Machine

All powered with Caterpillar D-386 Engines

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2400 LIMA—4500 MANITOWOC DRAGLINES

2400 Lima, 110' Boom, 6 yd.
Price—$80,000

4500 Manitowoc, 120' Boom, 5 yd.
Price—$82,000

4500 Manitowoc, 120' Boom
5 yd., 1½ yrs. old
Price—$132,000

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313 Hazleton Nat'l. Bank Bldg.

Hazleton, Pa. GLadstone 5-3658

FOR SALE

3 10" McCully Gyratory Crushers
3 Traylor No. 412 Type TZ Gyratory Crushers
2 Traylor 8" Gyratory Crushers
1 New RCA Metal Detector 10" x 36" aperture
6 Used single deck Robins Gyrex Screens with bases
5 Used single deck Robins Vibrex Screens
1 Used Cameron pump, size 10", 2400 G.P.M. 125" head, 1150 R.P.M., Left Hand, Serial No. 57537
1 Used Cameron pump, size 10", 2400 R.P.M., 125" head, 1150 R.P.M., Right Hand, Serial No. 57535
1 New Edison Voice Writer (Dictaphone)
1 Marion Model 490, Serial No. 6201, Ward Leonard Control. Also spare parts. In addition, we have a substation 2300/440 Volt with three 150 KVA Transformers.
1 20" Traylor Heavy Duty Finishing Crusher
4 Allis Chalmers Gates "D" Crushers, Size 6
1 Traylor Rolls Crusher—30" x 72"
* 1 Fuller Kinyon System
* 1 Allis Chalmers Compeb Mill
1 Gill Horizontal Bit Dresser
1 1-Ton Cummer Black Top Plant
* 1 Covered Steel Barge, suitable for carrying cement
* 1 Covered Wooden Barge, suitable for carrying cement
1 Thew Lorain 60 Shovel
1 Used Verifax Printer Type 1

* Available after January 1, 1957.

NEW YORK TRAP ROCK CORP.

230 Park Ave. New York 17, N.Y.

Telephone Murray Hill 9-8500

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60x48 Buchanan Jaw new condition with 48"x16" Telsmith Feeder.
30"x36" Traylor Blake Model M.
24"x36" Allis Chalmers Worthington, Rebuilt.
18"x36" Austin West Top Ecc. with Feeder.
13x24, 12x30, & 18"x36" Farrel Blake Jaw.
9½"x15" Dodge Lever Type Jaw, Rebuilt.
37½ Kennedy, 550 Volts Connected.
38½ Kennedy Belted Gyratory.
30"—20" & 10" Allis Chal. Superior McCulley.
#9—7½—6—5—4K Allis Chalmers Gyratory.

LOCOMOTIVES & CRANES

15 Ton Diesel 60' Boom Whitley Crane.
3—65 & 44 Ton G.E. Diesel Elec. Locomotives.
10 Ton Plymouth Diesel Locomotive.
100, 35 & 25 Ton G.E. Diesel Elec. Locomotive.
25 Ton Amer. Diesel Loco. Crane. 50' Boom.

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12 Rod Mills 30" x 54", 4' x 14', 5' x 10', & 6' x 12' Denver, Marcy & A.C.
45 Ball Mills: 3x4', 3x7', 4x5', 5x8', 5x10', 5x18', 6x5', 6x8', 6x10', 6x9', 7x5', 7x6', 7x7', & 8 Marcy 66.
39—Hardinge Mills: 10'x48", 8'x18", 8'x36", 8'x22", 7'x36", 6'x36", 6'x22", 6'x14', 5'x36", 5'x24".

ROTARY KILNS

19—4'x30', 6'x28', 7'x110', 9'x135' & 5'x50'.

ROTARY DRYERS

3'x36', 4'x20', 5'x25', 4'6"x40', 10'6"x60'.

AIR COMPRESSERS

410 CFM Ingr. Rand 90B—100HP—440V.
1578 Ingr. Rand PRE2—4100/2300 V.
2—2874' Ingr. Rand PRE3—478 HP, 2300 V.
3078' Ingr. Rand PRE2-500HP 440V.

R. C. STANHOPE, INC.

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BARGAINS: 25 ton MM Crash Crane. 2-Link Belt 3x8' Vib. & 48" Revolving Screens. 1824 Gruendler Port Crusher w/elec. screen bins.
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DRYERS: 4½x40, 5x30, 5½x50, 6x40, 7x110, 8x125.
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CRUSHERS: 4x6, Tx9, 1026 Allis, 1016 Gruendler, 1030 Pioneer, 1040 AW, 1524 Univ. 1538 Wis. 1836, 2036, 2436 & 2540 Cr. 4042, 4836 Farrell, 6248 Traylor JAW, 412TZ & 2'4" Traylor, 32" Telsmith, 9K & 16" Allis C. GYR. 2018, 4022 AW DBL ROLL. 2 & 3' Symons CONE.
PLANTS: Pioneer 305W. CR Pitmaster, AW81, Stedman 30 TPH.
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Mid-Continent Equipment Co., Inc.

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PROJECT ENGINEER WANTED

Graduate Mining, Metallurgical, Chemical or Mechanical Engineer, preferably 25 to 35 years old, wanted by medium size progressive heavy machinery manufacturing company, located in South eastern Pennsylvania. To assist in design and preparing for market of various lines of equipment used in mineral dressing, heavy chemical, cement and rock products industries. Must have had engineering and field experience, and be willing to work on drafting board, travel and to do field service. Opportunity also exists for a properly qualified individual, eventually to become sales engineer. Salary open.

BOX N-65, ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill.

FOR SALE BY OWNER

1 Hammermill—24"x24" Eagle
2 Locomotives, 8 and 12 ton, 36" gauge Plymouth, Gasoline
22 Cars—2 yard capacity, 36" gauge, Atlas Car and Manufacturing Co.
2 Pumps—2", Model C Wilfley
1 Screen—3'x8' single deck, W. S. Tyler dewatering
6 Pumps—3" Bingham Pump Company—Service liquid flotation feed 35' head, 475 G.P.M.
16 Pumps—4" Bingham Pump Company—Service liquid flotation feed 55' head, 290 G.P.M.
6 Flotation cells—Morse-Weining type, Size 42"x42"x48"

For further information contact J. H. Clements,

BASIC INCORPORATED
P.O. Fostoria, Ohio — Maple Grove, Ohio

Used Equipment List Sent On Request

4' std. and 5½' shorthead Symons cone crushers. 30" Superior McCully gyratory. 9'-6" x 12', 5 x 14 & 4 x 11 **ROD MILLS. BALL MILLS:** Hardinge conical 8' x 18" x 36", Nordberg 9'-6" x 11'.
JAW CRUSHERS: 84 x 66 Allis Chalmers, 36 x 42 Traylor, 20 x 42 Pioneer, 25 x 40 Cedar Rapids, Cedar Rapids 5050 impact breaker, 32 x 42 impact breaker portable plant, Pennsylvania hammermills 8XH, 16F and 8XC-1258.
SPIRAL CLASSIFIERS: 40", 60" and 72". **APRON FEEDER** 54" x 16'.
LOCOMOTIVES: Sixteen—125 ton diesel electric, 45 ton G.E. diesel electric, 20 yd. std. ga. side dump cars. **KILNS & DRYERS:** 10 x 78, 8 x 113, 8 x 123, 10 x 150, 6 x 40, 36" **BELT CONVEYORS** 584', 825' & 150'. Aggregate handling equipment including approx. 1600 ft. of 24" conveyors, feeders etc. 400 yd. 5 aggregate compartment Octo bin with 400 barrel cement compartment, complete cement mixing plant.
Many Other Items For Mining And Construction.

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Box 97 — Phone 500 — Crosby, Minnesota

1—15" x 30" Reliance Jaw Crusher.
1—12" x 28" Climax Jaw Crusher.
3—10" x 20" Champion Jaw Crushers.
1—7" x 13" Champion Jaw Crusher.
1—6" x 15" Sturtevant Jaw Crusher.
1—10" x 20" Allis-Chalmers Blake Type Crusher.
1—16" x 10 Sturtevant Balanced Type Rolls.
1—16" x 12" Corrugated Cinder Rolls.
1—New Holland 20B Hammermill.
1—#19 Kennedy Gyratory Crusher.
1—New Link-Belt 3' x 5' Shakeout Screen.
13—New Link-Belt Reducers 6—25 H.P.

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All sections available together with all accessories. Also Spikes, Bolts, Cars & Locomotives.

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All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors, Falk Shaft mounted Speed Reducers, couplings and V-belt drives.

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Special: Pioneer belt conveyor, 200' long, 30" belt, with gravity belt tightener, etc.

Northwest truck crane	Cletrac DGH; Drott loader	9x36 jaw crusher
Lessman loader	Harris Power Horse; 2½ yd. bucket	16x16 roll crusher
Hopper car unloader	Pioneer 9x36 port. crusher plant	Eagle cinder crusher
40' bucket elevator	Lima ⅝ yd. dragline; 30" shoes	Symons bar grizzly
Austin Badger shovel	24"x85' B-G belt conveyor	3 yd. Dumpcrete

These machines reconditioned in our newly built daylight plant. Come see them.

10030 Southwest Highway — TRACTOR & EQUIPMENT CO. — Oak Lawn, Ill.

Lancaster 6' dia. Vert. Mixer 35 HP.
Kent Model #2 Continuous Mixer.
Abbe 27" x 30" Ball Mill Chrome-Mang. lined.
Raymond #00 and #1 Pulverizers.
Kilns, Dryers, Filters, Hammer Mills, Crushers.

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STEIN EQUIPMENT CO.
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Martinsville, Virginia — Phone 6588

QUARRY EQUIPMENT

1—GMC Twin Diesel, direct connected to 200 KW generator (less than 500 hr's.)
1—4'x6' double deck screen.
1—4'x10' double deck screen.
1—4'x8' Triple deck screen.
1—Kennedy 20" gearless crusher with 75 hp integral motor.
1—Traylor 3' cone crusher.
1—24"x110' lattice frame conveyor.
1—24"x75' lattice frame conveyor.
3—8'x18', two comp. steel bins.
1—315 diesel air compressor.
1—Bucyrus-Erie ¾ yd. diesel shovel.

KLECKNER'S QUARRY
Helfrich Springs R.D. 1 — Allentown, Pa.

CHIEF CHEMIST WANTED

Must have ability to handle all phases of cement manufacturing laboratory, mix controls, etc., and to produce all types of cement for small cement company. Practical plant operating experience a necessity and could lead to Plant Superintendent's position. Retirement income, insurance and medical coverage. State qualifications in detail, minimum salary expected.

BOX O-43, ROCK PRODUCTS
79 W. Monroe St., Chicago 3, Ill.

18" x 24" Gruendler double roll crusher, roller Brng, one smooth one corrugated roll, mounted on 4-steel wheel trailer, gas power, bucket elevator all mounted on common frame. 3-steel jackleg bins revolving screen, this machine in excellent condition, priced at only $2850.00. as listed above, f.o.b. Cars.

10-B Telsmith gyratory excellent condition only $2500.00 f.o.b. 20" x 36" Cedar-Rapids roller Brng jaw excellent only $5,000.00. 25" x 40" Cedar-Rapids roller Brng jaw, excellent $10,500.00.

C. A. CONSTANCE & SONS
Box-2322 — Phone 3-3968 — Asheville, N.C.

FOR SALE—SAND PUMP

10" Amer. Manganese motor driven sand pump, 2600 GPM, when pumping 10% solids, cap.—90 cu. yds. per hr.; 15% solids, cap.—135 cu. yds. per min., 500 RPM.

Philadelphia Transformer Co.
Box 566 — Dalton, Pa.

WANTED

Used rotary kilns located east of the Mississippi River.

BOX O-44, ROCK PRODUCTS
79 W. Monroe St. — Chicago 3, Ill.

Gardner Denver Horizontal Air Compressor, two stage, 12½x8x8, Model HAB, s/n 94558, 500 cu. ft./min., 125 pounds pressure, with Louis Allis Squirrel Cage Motor, 100 HP, 440V, s/n 601739.
All attachments for operation. Condition Good.

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P.O. Box 468, Phone 1286, Atchison, Kansas

CRUSHERS FOR SALE

3' Symons Gyratory Std. Head Crusher #3100.
30" McCully Gyratory with 150 HP, 720 RPM, 3/60/440.
36"x48" Penn. Hammermill Model 28XT-8 with motor 3/60/440 and pan feeder 36"x6'9".
24 x 36 Bacon Farrell Jaw Crusher with new Pitman Bearings and Eccentric Shaft.

CHARLES V. FISH CO., INC.
530 Hamilton St. — Allentown, Penn.
Phone HEmlock 5-4701

WANTED

30" Gyratory Crusher
42" Gyratory Crusher

The National Lime & Stone Co.
FINDLAY, OHIO

WILL LEASE ON ROYALTY OR SELL A LARGE DEPOSIT OF HIGH CALCIUM CARBONATE LIME-STONE WHICH LIES ALONG B. & O. RAILROAD.

ROBERT E. O'NEAL
Middletown, Va.

FOR SALE

2—Used 322 Type "R" Allis-Chalmers reduction crushers in running condition with motors.
1—New 3 x 8 D.D. Telsmith Vibro-King vibrating screen with motor.

New England Road Machinery Co.
South Boston, Mass.

ENGINEERS WANTED

Mechanical, chemical, civil, electrical, or mining engineers wanted by large cement company. Opportunity for training and advancement. Age preferably between 23 and 35 years. Write giving complete details of education, experience, and salary expected. Confidential.

BOX O-25, ROCK PRODUCTS
79 W. Monroe St. — Chicago, Ill.

ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT
WHERE TO BUY ADVERTISING IN CONCRETE PRODUCTS SECTION

WANTED Gypsum Production Engineers
Cement Production Engineers

Experienced men over 35 years of age with recent knowledge of production methods, process and machines in U.S.A. to act as Engineering Assistants and Design Consultants to plant design staff of large, well-known firm of Consulting Engineers in Midwest on new American projects. Must have working knowledge of large plant process and equipment, including wet and dry process cement plants, kettle and kiln gypsum set-ups and board plants. Engineering degree not required providing experience and know-how satisfactory. Salary commensurate with background and experience. All replies treated confidentially. Give complete personal data, age, education experience, references and salary required.

BOX O-42, ROCK PRODUCTS
79 W. Monroe St. Chicago 3, Ill.

DIESEL AIR COMPRESSOR, portable, 365 CFM at 100# PSI, Gardner Denver mfg., model WBH 2006, vertical; Power, Caterpillar diesel D-13000, 8 cylinder, 125 hp. One of the best models Gardner Denver made because of the extra power in the engine. New price over $10,000. Our S.P. $4500.

E. McCALLUM
121-55th St., Virginia Beach, Va.

POSITION WANTED—Italian industrial chemist, specialized in cement, 49 years old, married with two children, in good health, now resident of Argentina, South America; seeks employment in U.S.A.—in a Cement Plant. He is acquainted with the systems F. L. Smidth, Lepol, Polysius and Krupp. He has had a vast experience and is very competent in the production of aluminious cement, portlands (natural, artificial and pozolanic) and white cement. He has done essays (not only in the laboratory scale, but also on the actual production) using bituminous schists for producing Hydraulic lime; and has registered his patent. He has also a registered patent for producing white cement with new minerals. He has organized the production of new cement plants and has published technical reports in Italian and Spanish Languages. Salary whatever is prevailing for comparable qualifications. Available for U.S. Immigration upon request. Write: Sergio Vatta, 3301 W. Polk St., Chicago 9, Ill.

WANTED

Equipment Maintenance Superintendent for 400 truck, 70 crawler unit fleet. Outstanding opportunity with one of the largest, most progressive companies in the midwest. Send resume of education, experience, and salaries earned. Also name of contact at your local bank.

BOX O-45, ROCK PRODUCTS
79 W. Monroe St. Chicago 3, Ill.

WANT TO BUY
ROTARY DRYERS
ROTARY KILNS
BALL & ROD MILLS
DIESEL LOCOMOTIVES
R. C. STANHOPE, INC.
60 E. 42nd St., N.Y. 17, N.Y.

Superintendent wanted for gravel plant involving dredging and barging materials. Also stone quarry operations. State full experience, age, list of references, and salary expected.

FRED R. McKENZIE & CO.
Rm. 405, Bondi Bldg., Galesburg, Ill.

WANTED
¾ Yd. Lima Shovel
Must be late model in excellent condition
Frank Swabb Equipment Co., Inc.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

INDEX TO WHERE TO BUY

Bacon-Pietsch Co., Inc. 189
Basic Incorporated 190
Bonded Scale and Machine Co. 186
Brill Equipment Co. 187

Chemical & Process Machinery Corp. 187
Constance, C. A., & Sons 190
Corson, G. & W. H., Inc. 188

Eighmy Equipment Co. 188

Fish, Charles V., Co., Inc. 190
Foster, L. B., Co. 189
Frank, M. K. 190

Gustin, J. A. & Assoc. 190

Heat & Power Co., Inc. 188
Heidenreich, E. Lee, Jr. 190
Heineken, W. P., Inc. 188

Johnson & Hoehler, Inc. 190

Kerford, Geo. W., Quarry Co. 190
Kleckner's Quarry 190

Machinery Center, Inc. 187
McCallum, E. 191
McKenzie, Fred R., & Co. 190
McLeod, Alex T. 189
Mid-Continent Equipment Co., Inc. 189
Mississippi Valley Equipment Co. 189

National Lime & Stone Co. 190
New England Road Machinery Co. 190
New York Trap Rock Corp. 189
Nussbaum Electric Co. 190

O'Neal, Robert E. 190
O'Neill, A. J. 188

Pennsylvania Drilling Co. 190
Perry Equipment Corp. 189
Philadelphia Transformer Co. 190

Smith, L. B., Inc. 187
Stanhope, R. C., Inc. 189, 191
Stein Equipment Co. 190
Swabb, Frank, Equipment Co., Inc. 187, 188, 189, 191

Thomasville Drilling & Testing Co. 190
Tractor & Equipment Co. 190
Troyer, Stanley B., Equipment Co. 190

Unverzagt, G. A., & Sons Inc. 188

Vatta, Sergio 191

Walsh, Richard P., Co. 187

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*Specify type.

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ROCK PRODUCTS

79 West Monroe St. Chicago 3, Ill.

- ___Admixtures, Aggregate
- ___Aftercoolers, Air
- ___Agitators*
- ___Aggregates (special)*
- ___Air Compressors
- ___Air Separators
- ___Asphalt Mixing Plants
- ___Bagging Machines
- ___Bags*
- ___Barges
- ___Batchers
- ___Belting, Conveyor, Elevator, Power Transmission*
- ___Belt Repair Equipment
- ___Bin Level Indicators
- ___Bins and Batching Equipment
- ___Bits*
- ___Blasting Supplies
- ___Block Machines,* Concrete Building
- ___Bodies, Trailer*
- ___Brick Machines and Molds
- ___Buckets*
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- ___Bulldozers
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- ___Valves
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INDEX TO DISPLAY ADVERTISERS

Adrian Peerless, Inc. 170
Albemarle Paper Mfg. Co. 93
Allis-Chalmers Mfg. Co. 22, 40, 58, 101
Allis-Chalmers Tractor Div. .2, 16, 17
American Brake Shoe Co. American Manganese Steel Div. 125
American Cancer Society 185
Arkell and Smiths 127
Atlas Powder Company 24, 25
Austin-Western Division 121

Babcock & Wilcox Co. 95
Baldwin-Lima-Hamilton Corp. 121
Baltimore & Ohio Railroad 48
Barber-Greene Company 103, 163
Berg Vault Co. 173
Bergen Machine & Tool Co. 140
Besser Company 155, 158, 168, 176, 178
Better Schools 112
Black Brothers Co., Inc. 134
Blaw-Knox Co. 165
Bucyrus Erie Co. 111, 119
Butler Bin Company 162

Campion-Detroit Company 176
Carlisle Corp. 75
Caterpillar Tractor Co. ..6, 11, 18, 50
Cedar Rapids Block Co. 173
Chain Belt Co. 33, 34
Clark Equipment Co. 42, 43, 89
Clipper Manufacturing Co. 176
Colorado Fuel & Iron Corp. 85
Columbia Machine Works 166, 167, 181
Combustion Engineering, Inc. 10
Concrete Transport Mixer Co. 169
Cross Engineering Co. 123

Dart Trucks 75
Davis, Frank D., Company 178
Dodge Manufacturing Corp. 118
Dodge Trucks 117
Dur-O-waL Products, Inc. 173

Eagle Iron Works 15
Edick Laboratories 179
Elberfeld Manufacturing Co., Inc. 179
Erickson Power Lift Trucks, Inc. .177

Fairbanks, Morse & Co. 56
Falk Corporation 91
Firestone Tire & Rubber Co. 136
Food Machinery and Chemical Corp. 142
Fuller Company 113

G. & H. Machine Co. 172
Gates Rubber Co. 8
General American Transportation Corp. 113
General Cable Corp. 115
General Electric Co. 30, 31
George, F. C., Machine Co., Inc. ..152
Gerlinger Carrier Co. 175
Goodrich, B. F., Co. 3
Goodyear Tire & Rubber Co. .....Back Cover
Gulf Oil Corp. 9

Handi-Crete, Inc. 173
Harnischfeger Corporation 38, 39
Haverstick Bros. 164
Haynes Stellite Company 129
Hayward Company 192
Hendrick Manufacturing Co. 132
Hough, Frank G., Co. 20, 21
Hyster Company 26

International Harvester Co. 20, 21, 80, 81, 98
Iowa Manufacturing Co. 54

Jaeger Machine Co. 109
Johnson, C. S., Co. 160, 161
Joy Manufacturing Co. 122

K & R Air Powered Equipment Co. 179
Kennedy-Van Saun Mfg. & Eng. Corp. 77
Kent Machine Co. 174
Kiesler, Joseph F., Co. 130
Kirk & Blum Mfg. Co. 172
Koehring Co. 160, 161

Lackey, W. H., Inc. 182
Large, H.B., Engineering Co. 123
Lehigh Portland Cement Co. 141
LeTourneau-Westinghouse Co. 105, 107
Link-Belt Company 1, 97
Ludlow-Saylor Wire Cloth Co. 73

Mack Trucks, Inc. 171
McNally Pittsburg Mfg. Corp. 134
Meckum Engineering, Inc. 128
Memphis Equipment Co. 156
Moore Dry Kiln Co. 178

Neptune Meter Co. 177
Nordberg Mfg. Co. 46, 47
Northwest Engineering Co. 53

Ore & Chemical Corp. 87
Oswalt Engineering Service Corp. 179

Penn-Dixie Cement Corp. 157
Pennsylvania Industrial Chemical Corp. 183
Pettibone Mulliken Corp. 79
Pfarrer-Schmidt Engineering Co., Inc. 134

Quinn Wire & Iron Works 156

Radio Corporation of America ...123
Raymond Bag Corp. 93
Raymond Div. 10
Resisto-Loy Co., Inc. 132
Richardson Scale Co. 156
Rinkin, C., & Olson, H. 159
Ryerson, Joseph T., & Son, Inc. ..118

Sauerman Bros., Inc. 126
Side-O-Matic Unloader Corp. 177
Smidth, F. L., & Co. 12
Smith Engineering Works 44
Southeast Ready-Mix 184
Sprague & Henwood, Inc. 116
Syntron Company 120

Texas Company 36
Thew Shovel Co. 133
Thomas Foundries, Inc. .....Inside Back Cover
Traylor Engineering & Mfg. Co. .. 7

Union Carbide & Carbon Corp. ...129
Union Wire Rope Corp. 28, 29
United States Steel Corp. 138
Universal Atlas Cement Co. 138
Universal Engineering Corp. 79
Universal Vibrating Screen Co. ..118

Western Knapp Engineering Co. ..135
Western Machinery Co. 135
Westinghouse Air Brake Co. 105, 107
Wickwire Spencer Steel Co. 131
Wilfley, A. R., & Sons, Inc. 192
Williams, C. K., & Co. 162
Williams Patent Crusher & Pulverizer Co. ..Inside Front Cover
Wood, Charles E., Co. 134

Yuba Manufacturing Co. 124

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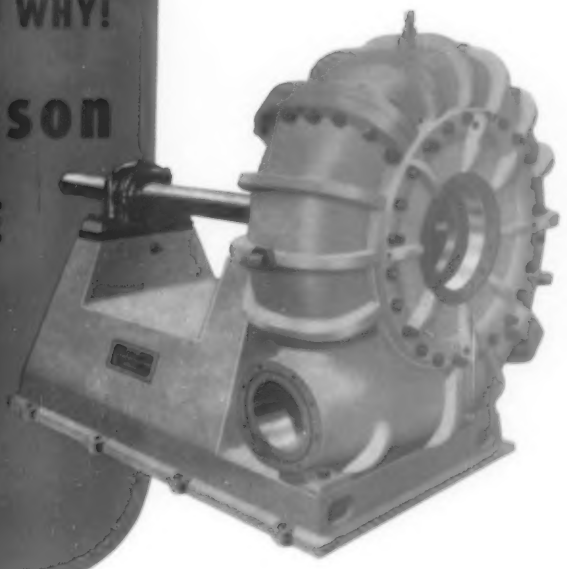

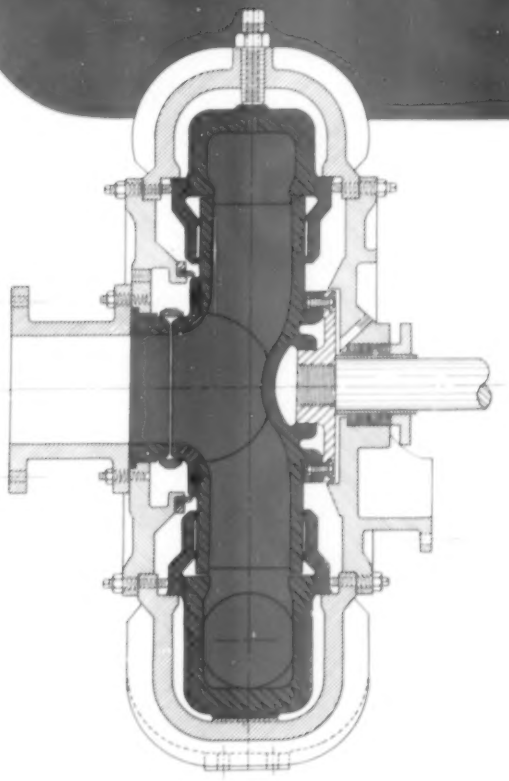

Cross-section shows in red the "guts" of a THOMAS PUMP, (all parts here assembled into a unit) made of Thomas NI-HARD ALLOY ..... the most durable, long lived, economical sand and gravel pump ever manufactured.

In a series of testimonial letters published in this magazine for many months, THOMAS "DURABLE" PUMP USERS in their own words have stated the highlights of their actual operating experience. Summed up, all of these Thomas Pump owners have said:

- THOMAS PUMPS tremendously increase service life.
- THOMAS PUMPS likewise increase sand and gravel production.
- THOMAS PUMPS greatly reduce downtime for maintenance.
- THOMAS PUMPS cut maintenance costs to the bone.
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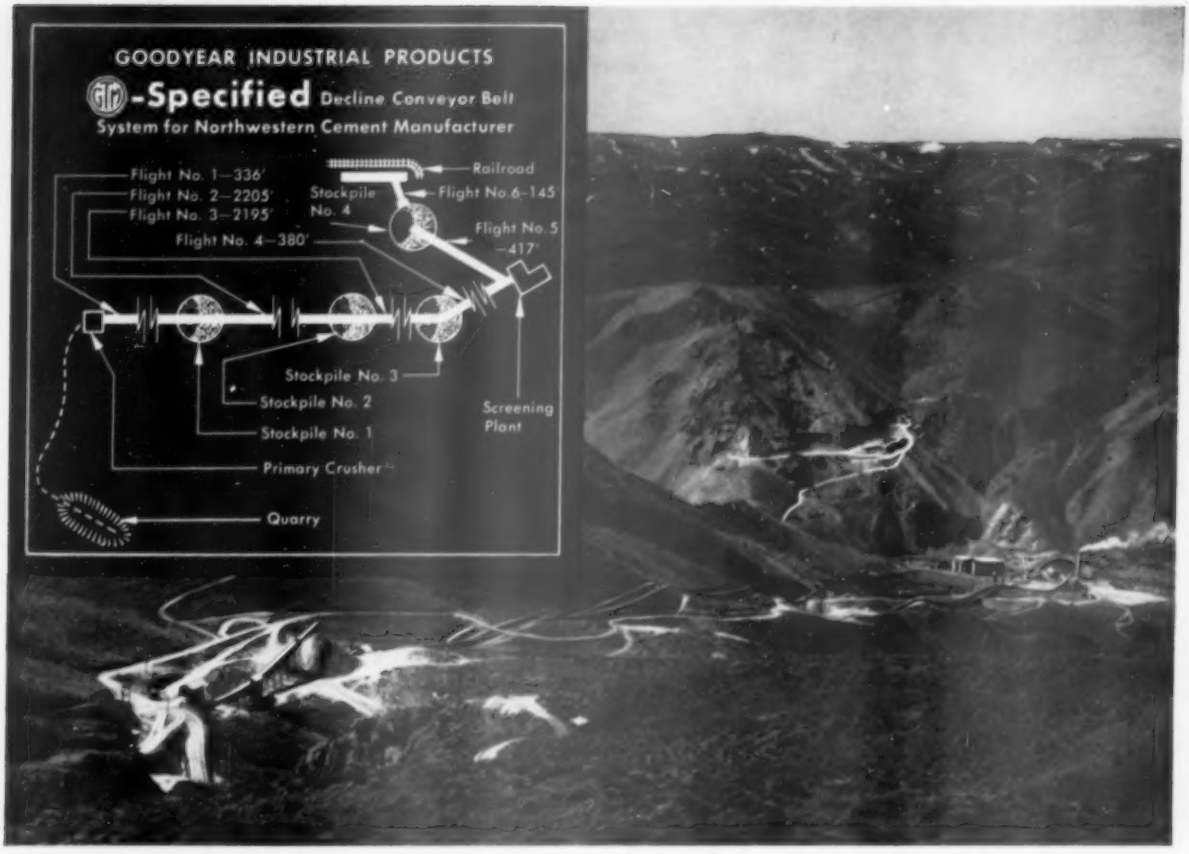

G.T.M. helps top mountainous problem with "rubber railroad"

THE PROBLEM was to design a system for moving crushed limestone from a proposed, mountaintop quarry a mile downhill to the mill. An aerial tramway had been used on a similar quarry, but its capacity was too limited and it suffered frequent operating stoppages.

After investigation of all types of haulage, a "rubber railroad" was chosen as the best answer to the tough service, rugged terrain and severe winters. With the help of the G.T.M. – Goodyear Technical Man – the system of interconnected conveyor belts was designed with surge piles between the main flights to insure an unbroken stream of stone.

At last report, the G.T.M.'s rayon reinforced belts – in over *18 months' operation* – had carried over *four times the tonnage* realized from the old tramway with virtually *no belt maintenance*–and at much lower cost. How can you cut costs with conveyor belts? Contact the G.T.M. through your Goodyear Distributor or Goodyear, Industrial Products Division, Akron 16, Ohio.

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